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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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With this issue is published an Index to Volume XXIV of THE CHEMICAL AGE, *covering the period January 3 to June 27, 1931, inclusive.*

A Jubilee Week

BY the time these words are before our readers' eyes, those who have been attending the chemical jubilee celebrations this week in London will be almost too tired to read them. For the programme, though full of attractions, was so crowded that only the abnormally vigorous could hope to enjoy even a percentage of what it offered without the risk of dyspepsia. That is the worst of these crowded weeks of glorious life—they are more than the average person can stand. Only in one respect are the chemical visitors entitled to apology, and that was the weather. After weeks of unbroken drought London celebrated their arrival by turning wet to a depressing degree, and some of the functions inevitably suffered.

Of the single features of the week perhaps the plant exhibition will be remembered as the most important industrially. It was the most representative collection of British chemical plant ever brought together, and the one cause for regret is that counter attractions did not permit the attendance to be as large as the exhibition deserved. The opening ceremony by Sir Harry McGowan is reported at length, together with articles describing their impressions by Mr. P. Parrish and Mr. A. Grounds, and further notices of the exhibits. Among the features of the purely chemical programme two certainly stand out—the presidential address by Sir Harry McGowan, recognised by all who heard it as the work of a master industrialist mind, and that of Dr. Herbert Levinstein, in which he traced the history of the British dyestuffs industry out of his own intimate experience and deduced from it many lessons that other industries might profitably ponder. Other notable scientific contributions were made during the week.

The Society's business meeting calls for little comment. Professor G. T. Morgan's election to the presidency in succession to Sir Harry McGowan was clearly a popular choice, and everyone will wish Professor Morgan a happy and prosperous year of office and offer him congratulations on a well-earned distinction. The two business problems confronting the Society are those of membership and finance. The upward curve in membership, which was recorded at Birmingham last year, has unfortunately not been maintained, and again there is a decline. It is disappointing, especially to those who have worked so hard to move forward. Membership is closely related to finance, and though this year the income has exceeded the expenditure, the future from the financial side is not free from a certain amount of anxiety. The large amount, however, raised towards the cost of the jubilee celebrations and such spontaneous gifts as those of Mr. John Gray indicate the readiness of wealthy members to come to the rescue.

Nearer the Goal

FRIENDS often ask the ultimate object of chemistry. "You tell us," they say, "that chemists have discovered all the predicted elements and have gone a long way in establishing their properties, their physical constants, and those of their compounds. You claim, moreover, nearly to have finished the remarkable task of establishing the nature and constitution of all but a very few of the organic compounds which are found in plants and animals; whilst, in not a few cases, you have been able to make these from much simpler substances—that is, from their ultimate elements by synthetic means. Your laws and knowledge of structure are such that you can largely predict happenings in the test tube, as in *vivo*. As yet you require somewhat strenuous conditions both of elevated temperature and high pressure to bring about your reactions, which contrast sharply with the ease with which such changes take place in the living cell, but the extension of the knowledge of catalysts holds out hope for progress even in this direction. We are aware of all that is being done by chemists, in a multitude of directions, to

apply this knowledge in industry, thereby bringing benefits of every sort to mankind—health, food, raiment, housing, transport, luxury, amusement! Do you claim," they inquire, " that chemistry will soon be in a position to explain life itself, the composition of our tissues, the metabolism of our food, the inheritance of our characteristics, nay, everything except mind and the soul? "

The answer is in the affirmative, for such is, indeed, the chemist's hope and intention. The clues which he knows so well to follow are there. For example, the impulses that warn the stomach that food is about to be taken and cause the digestive enzymes to get ready to deal with it are sent by chemical messengers, and chemical policemen, housed in stations in the ductless glands, exercise a protective control on most of our daily functions. We put aside a discussion of chemical physiology, however, to speak of heredity, one of the most outstanding fields of interest. The external features alike in man, in animals or in plants which we are accustomed to regard as hereditary or characteristic of a particular species are but external manifestations of what must be in reality internal chemical factors. Colour, smell, abnormal growth, unusual metabolism, are all definitely chemical. Of these, colour should be one of the easier and more obvious to follow, and indeed the inheritance of colour factors in plants has been frequently studied. Mendel, a cloistered monk, first taught us the mathematical relationships governing the transmission of colour. For a long time the factors concerned have been thought to be a colourless body capable of being oxidised and an oxidising agent. Now that the relationship between the three type anthocyanidins—pelargonidin, cyanidin, delphinidin—is understood—they differ only in containing one, two, or three hydroxyls in the phenolic nucleus—it is possible to postulate a change in colour due to oxidation as a mutable factor.

Proof that this is the case has just been given by Miss Scott Moncrieff, who has broken up a rose-pink geranium into its constituents by selfing it. The bulk of the seedlings resembled the dominant parent; a few were salmon-pink and clearly recessive. The latter contained pelargonin and no cyanin; the parent and the former contain cyanin and a slight trace of pelargonin. The colour change, therefore, involves the addition of a single oxygen atom which converts pelargonin into cyanin, and the dominant factor converting salmon into rose is in some way concerned with the oxidative processes of the plant. The veil of ignorance is lifting, and as it be drawn aside fresh results will follow. The glamour of success is in the air, the chemist may well feel chosen, exempt and curiously happy; the secrets of life, of the transmission of chemical characters, are being made plain to him.

Overseas Chemical Trade

PERCENTAGE figures calculated from the statistics given in the Board of Trade returns for British overseas trade during June, show that chemical exports have experienced a slight setback, being 19·0 per cent. below those of June, 1930, whereas in May they were only 15·4 per cent. below those of May, 1930. Chemical imports, on the other hand, continue to show improvement, as the decline in this case is now only 8·8 per cent. below that for June, 1930. The actual statistics given in the returns show that imports totalled £925,374; exports were £1,282,048; whilst re-exports were only £46,654. Considering the re-exports quite apart from the other statistics, it is to be noted that the decline here is only £7,805 as compared with June, 1930, but £83,129 as compared with June, 1929.

"The Working Man's Fuel"

SIR FRANCIS GOODENOUGH, in an address to the Royal Sanitary Institute at Glasgow last week, confidently declared that electricity is not, and never can be, the working man's fuel. " Never," perhaps, is a risky word to use about anything, but Sir Francis was on safe ground in condemning the policy of compulsory use of electric cooking stoves and prohibiting the use of gas and in recommending gas and coke as " the two economical smokeless fuels." His point was that this policy is calculated to force the working class into the use of raw coal for domestic purposes, and as his address was concerned mainly with air pollution from fuel, his aim was to emphasise the importance of smokeless as against smoky fuels. " Let us," he said, " send out coal to the gasworks to be turned into gas and coke and use up in our chemical works the tarry matter that combines with soot from the chimneys of houses and factories where the mediæval method of coal burning still continues." He also declared it to be " as great an offence against manners and morals to empty the filth from fireplaces into the air of heaven as it would be regarded to-day to follow the barbaric practice of emptying sewage filth into our streets with a cry of ' Heads below.' "

S.C.I. Finance

THE annual balance sheet of the Society of Chemical Industry, though not abnormally exciting, usually has some small points of interest, and this is true of the annual financial statement to the end of December 1930. In spite of special efforts to increase membership and revenue, the figures from year to year show little fluctuation. The balance of income over expenditure for the past year is £394 against £342 in the previous year, although members' subscriptions and revenue from advertisements are both lower. Editor's and assistants' salaries and advertisement salaries and commission have increased, but staff salaries and pensions show a decline. The Society's investments at market value are returned at £14,856, as compared with £18,268, cost price, a decline of 18·13 per cent. on cost. The Messel Fund investments stand at £26,204, although the market value of the securities at December 31, 1930, is estimated at £30,142. The grants out of the fund consist of £50 to the Federal Council, £21 for a special article written for *Chemistry and Industry*, £100 to the Chemical Society's Library, £10 for a special lecture to the London Section, £50 to the Faraday Centenary Fund, and £50 to the Society's Jubilee Fund.

Books Received

QUALITATIVE CHEMICAL ANALYSIS. By Herman T. Briscoe. London: Macmillan and Co., Ltd. Pp. 280. 10s. 6d.

Association of British Chemical Manufacturers

How to Increase Chemical Exports

THE fifteenth annual general meeting of the Association of British Chemical Manufacturers was held at the Chemical Society's Rooms, London, on Thursday, July 9, Dr. E. F. Armstrong, F.R.S., presiding.

The Work of the Year

In moving the adoption of the report, the chairman said :— The decline in membership is an inevitable consequence of the times through which we are passing. The Council feels assured, however, that members, as a whole, fully realise the importance of the Association and the prime necessity of maintaining their active support of it, because it is in times of difficulty that there is the greatest need for the utmost exercise of the co-operative spirit we represent if the economic problems which face our own and indeed all industry are to be solved. On the subject of legislation I regret that our efforts to secure a remission of the Hydrocarbon Oil Duty on Turpentine when used as a raw material in chemical manufacture did not meet with success, in spite of the strong support which the proposals received from many quarters and the sympathy accorded it by members of the Government. The ostensible reason was the fear that the balance of the Budget would be upset if even the smallest concession were granted.

Protecting Home Industries

Fiscal policy is always a contentious question because in the past it has been so wrapped up with party politics, which the Association carefully eschews, instead of being treated on purely economic lines quite outside the political arena. The dangers that may arise from wholesale tariffs are appreciated by all who have examined the problem in an impartial spirit, but it should surely not be beyond the power of man to devise a system to secure the protection of the home market and the British manufacturer without reacting to the ultimate disadvantage of the consumer. We have the examples of the Key Industry Duty on fine chemicals and the Dyestuffs Act before us to show the great benefits that the country may derive from carefully conceived legislation which affords to industry the confidence and security essential for the launching of new enterprises. The policy of the Federation of British Industries aims not only at securing the home market to the British producer, but also at developing our inter-Empire trade to the benefit of the Empire as a whole. The statistics circulated to all our members last autumn showed that the imports of chemicals, drugs, dyes and colours into this country were valued at £14,000,000, while of the total importation of chemicals into the rest of the Empire, the United Kingdom only secures 38%, leaving a balance of £23,000,000 worth of chemicals which come from foreign countries but which could well be supplied by the United Kingdom. In other words, the chemical trade of the Empire as a whole which goes to other countries amounts annually to £37,000,000. Surely it is worth while making a special effort to secure the bulk of this business for the home country.

Chemical Standardisation

The first stage of the task which the Association undertook a year ago, in order to put British Chemical Standardisation on a proper basis, has been successfully completed. That there was a real need for this is shown by the fact that throughout there was complete unanimity among the various chemical interests, and the final scheme was accepted without a single dissentient. I should like to add a word of tribute to the British Engineering Standards Association, and in particular to its director, Mr. Le Maistre, for the help and statesmanlike manner in which they acted throughout these delicate negotiations. You will feel gratified that your Patents Committee, over which Dr. Carr presided, has been able to secure the acceptance of most of the proposals which it submitted to the Board of Trade Patents Committee which was dealing with the reform of British patent law and practice. The efforts which the National Creosote Committee is making to develop the utilisation of creosote and tar oils for Diesel engines deserve the greatest possible encouragement as an important contribution towards the solution of the problem of providing a national source of liquid fuel.

Fine Chemicals and Dyestuffs

The fine chemical industry continues to make steady progress, and we can produce irrefutable data to prove that the Key Industry Duty has been instrumental in promoting the development of this important key industry to the benefit of the country as a whole. Group VI is to be congratulated on keeping its powder dry against any emergency. We are indeed grateful for the respite which the dyestuffs industry has received. Had the prohibition of imports been removed last January, a serious situation would have arisen, which would have been aggravated by the depressed condition of the colour consuming trades throughout the world. It was gratifying to find during the controversy which raged prior to the final decision to extend the Act for one year, that there is now beginning to be a wide recognition by press and public of the importance of the dyestuffs industry to the whole scheme of industrial development and progress, and of the fact that this importance is out of all proportion to the size of the industry as measured merely by the number of employees, or the value of its output. The dyemakers are doing everything they can to obviate any trace of economic disadvantage to the users, and it is interesting to note that an important colour consumer has recently admitted in a public statement that the Act no longer imposes any hardships on the dye using interests.

Future Policy

In the past, the work of the Association has mainly been what might be called of a defensive nature. I would submit that the Association's activities should assume a more offensive aspect, especially in view of the general depressed condition and lack of trade. What I advocate is a concerted attack to secure a larger share of the chemical trade of the world. I have already indicated that in the British Empire alone there is some £37,000,000 worth of business which the foreigner is securing and which might well come to this country. Are we doing all we should do by co-operative effort ? It is true that our national prosperity has, in the past, been built up largely on individualistic lines, but is not the day of individualism rapidly passing ? Every British Mission which has gone abroad in the last year has come back with the same story, namely, that we are losing our share of the markets owing to our weak selling arrangements, and that the method of grouping for export purposes should be investigated.

Mr. C. A. Hill (British Drug Houses, Ltd.), in seconding the adoption of the report, paid a tribute to the work of the Association on behalf of the chemical industry and to the importance of maintaining a strong Association which would serve as the official mouthpiece of the industry in dealing with Government Departments both at home and abroad.

After Mr. E. V. Evans (South Metropolitan Gas Co.), the honorary treasurer, had commented on the accounts, the report was thrown open for discussion.

Dr. G. C. Clayton (Imperial Chemical Industries, Ltd.) congratulated the chairman on a number of activities which had been due to his special efforts. He referred in the first instance to the Model Safety Rules which had been appreciated so much by everyone in the industry. On the subject of Empire trade he said that the increase of export of chemicals to the Empire was a subject in which the Association was bound to be interested. He acknowledged thanks for the great efforts which were made by the Association to get the Government to agree to the continuation of the Dyestuffs (Import Regulation) Act. While the past year had been a very difficult one for everybody in the chemical industry, he felt that the chemical industry itself was in a happier position than practically any other of the big industries.

Dr. F. H. Carr (British Drug Houses, Ltd.) thanked the chairman for his reference to the work of the Patents Committee and to the gratification which the Association shared with the Committee in the effect of their labours.

Mr. A. A. King (Albright and Wilson, Ltd.) expressed the hope that chemical manufacturers might come together and exchange views about business prospects a little more frankly than had hitherto been done. A little less suspicion of one another's business habits would help.

Characteristics of British Chemical Plant

An Impressive and Representative Display

It would have been impossible to begin this week of chemical jubilee celebrations in London more impressively and more appropriately than by such an exhibition of British chemical plant as that which Sir Harry McGowan opened in the Central Hall, Westminster, on Monday morning. There one saw, in the most concrete form, all that industrial chemistry means—the raw materials, the engineering design, the technical workmanship, the ingenious mechanism by which the discoveries of the laboratory are converted into large scale production. Thus it was that the chemical engineer—that mythical creature of a few years back—expressed himself, illlustrated his invaluable functions, and justified his place in chemical industry. The exhibition was worthily representative of the British plant manufacturing industry in that it included the chief makers in this country and almost every phase of their science. It was impressive in that it testified to the quality of British raw materials and to the thoroughness of British engineering workmanship. The whole collection spoke of quality of production—which, here as in so many matters, is the enduring British asset. To bring this fine collection of plant together in the very heart of London, indeed of the Empire, to have it so well installed in a building not ideally adapted to the accommodation of such large and heavy units, was a splendid achievement, involving considerable outlay and trouble. But the plant people either leave things alone altogether or do them supremely well, and once they had decided on the exhibition the rest may be said to have followed. There is only one matter for regret, namely, that such an exhibition could not remain open longer, be seen by much larger numbers, and even be shown in our leading provincial centres. For the jubilee celebrations, mainly on quite the other side of London, and the extent to which the jubilee week is packed with other attractions leave the delegates to the jubilee meetings but little time to explore the exhibition as it deserves to be. How this defect is to be got over, however, is not very clear. Even the chemical engineer, resourceful as he is, cannot arrange for visitors to be in half a dozen places at the same time.

There was a large and distinguished company at the opening ceremony. Dr. Bush, as the chairman of the British Chemical Plant Manufacturers, presided and explained simply and clearly how the idea of the exhibition arose and what it aimed to achieve. Naturally he emphasised the fact that it was essentially British, in a much fuller sense than the exhibits, for example, of the British Industries Fair, and the duty which lay upon the British plant users to support the products of this country in their own interests and in those of industry generally. Sir Harry McGowan's address in opening the exhibition, covered the ground in his usual quiet, thoughtful and thorough fashion. The high position he occupies in the industrial field, his long and intimate acquaintance with industries based essentially on good science and good engineering technique, and the shrewd balance he always maintains between laboratory theory and works practice gave his address more than the usual importance. It deserves more than passing attention ; it is worthy of study. There was nothing spectacular about it ; it was not designed to elicit ringing cheers ; but when Sir Harry touched on one point—the exhaustion of financial reserves in industry through excessive taxation—the spontaneous applause indicated how close he came to realities in dealing with the existing industrial situation. After the opening ceremony, there was a well-attended luncheon, at which many of the points in the morning's speeches were further emphasised.

The annual meeting of the Society of Chemical Industry on Tuesday morning attracted a large number of delegates and was conducted in a thoroughly businesslike way. The fiftieth annual report of the Council was not unduly optimistic. The membership is once again on the down grade. The number of registered members on July 14, 1931, was 4,540, a reduction of 56 from the 4,596 of the year before. The detailed figures of the past five years show successive annual decreases of 93, 61, 98 and 56, broken last year by a solitary advance of 46, which may fairly be ascribed in part to Dr. Levinstein's exceptional efforts. Circumstances were mentioned to account for the position, but the downward tendency is too persistent to be easily explained away. Similarly in the matter of finance, Dr. Colgate presented the situation in his admirably clear and illuminating way. It is satisfactory, of course, to have a balance on the right side, but some of the remarks dropped by Dr. Levinstein and by Dr. Colgate—two of the best friends of the Society who would not willingly labour any difficulties needlessly—indicated that the future is not quite free from anxiety. These remarks were made the more ominous by the references to the increasing membership of the Institute of Chemistry and other bodies, and listening to them one could not help recalling also the information that Dr. Charles Parsons, the secretary of the American Chemical Society, had communicated to ourselves a few minutes before, namely, that the American membership is up from 18,000 to over 19,000 this year, following on a similar advance in the previous year. The contrast sets one reflecting.

The presidential address by Sir Harry McGowan was a very carefully prepared document, and seemed from beginning to end to express the personality of the speaker, equally in its terms and in its matter. The earlier part was concerned with the developments of chemical industry in this country and contained many interesting facts and figures. For instance, it was interesting to hear that, while the overall increase in British exports in the past half-century was equal to 53 per cent., the increase in British chemical exports amounted to 93 per cent. But as the address proceeded the purely chemical and historical aspects receded in favour of the economic and industrial, and on the latter aspects of the present position the address carried unusual weight. It closed with a serious note on the subject of tariffs, guarded and moderate, but sufficient to indicate the trend of ideas among responsible British industrialists.

There was no formal installation of Professor G. T. Morgan, the new president, in the chair of the society, but the announcement of his election was very cordially received, and Sir Harry McGowan's appreciation of his personal qualities and scientific attainments and achievements made a truthful and engaging portrait. The elections to the vice-presidency and to the vacant seats on the council appeared to be also warmly approved.

The presentation of the Society's Medal to Dr. Herbert Levinstein was the chief feature of Wednesday's programme, and it brought together a large and keenly interested company. Here, again, as indeed throughout the meetings, Sir Harry McGowan admirably discharged the duty of Public Orator, referring in graceful and appreciative terms to the two Levinstein's—" Father and Son "—whose names would ever be associated with the British Dyestuffs industry and also with service to the Society. Dr. Levinstein's address, in reply, was entitled " From within the

dyestuffs industry," and it gave out of his singularly complete experience of the industry an inner history of its developments, with abundant lessons for other industries. It was, like Dr. Levinstein's presidential address of last year, a brilliant production, relieved by clever spontaneous "asides" as he proceeded, which kept his hearers rippling with merriment. In the vote of thanks proposed by Mr. Woolcock and seconded by Dr. Dunn, it was described as "fascinating," as a great chapter of dyestuffs history, and as a contribution that would be highly valued. Certainly, the prolonged applause that followed its delivery left no doubt as to the pleasure with which it had been listened to.

The annual dinner of the Society at the Great Central Hotel was attended by Prince George and was a very successful social function. In the course of the evening Sir Harry McGowan made another important statement in which he suggested the creation of a new post of Minister of British Industry. "We need above all things," he said, "one Minister of State who is so seized with the vital needs of British industry that he will devote all his time and attention to promoting co-ordinated reorganisation of our methods. He must indeed be a man of rare qualities. He needs to combine the knowledge of a student of economics and statistics with the hard sense of practicalities drawn from active industrial experience. He must have wide human sympathies, sensitive both to the aspirations of labour and the requirements of invested capital. I see him as a man dealing with industry after industry, bringing the leaders of each together, placing at their disposal all the Governmental information which may smooth away their difficulties in co-operation, reconciling divergent interests, sympathetically considering their financial needs and difficulties, drawing upon his Ministerial colleagues for all the aid and information—financial, statistical, and otherwise—that they can give him until gradually, possibly slowly, possibly with difficulty, but undoubtedly with certainty, he will rearrange the scattered divisions so that their task of bringing British industrial and commercial services to the use of the nation and the world may be more efficiently and less wastefully performed."

A visit to the Plant Exhibition just before going to Press showed that, in spite of the number of counter diversions, the exhibition has attracted a steady stream of visitors who have been much impressed by the quality and range of the exhibits. One American visitor compared it favourably with the New York Chemical Plant Exposition, and suggested that, as in the American case, the exhibition was important enough to have at least one whole week entirely to itself. What impressed him most was the sterling quality of the products on view, rather than any element of novelty. "That, of course, is the British way as compared with the American," he said. "We lay, perhaps, too great stress on novelty features; you go in for solid quality, but after all, the best quality goods will not sell themselves without skilful appeal to the interests of the buyer. The New York Exposition has thoroughly established itself, and in consequence of the large attendance of buyers it has become an important medium for doing business and not merely dressing up the window."

Mr. J. Davidson Pratt, general manager of the A.B.C.M., has had a strenuous time, together with the members of his staff, throughout the entire week, and is able to look back on his efforts with complete satisfaction.

Among the delegates to the Jubilee meeting are many from overseas. Prominent among these is Dr. Charles L. Parsons, the secretary, or general director now, of the American Chemical Society. Dr. Parsons, with his wife, has been in this country about a month, touring England, Scotland and Wales. He has thoroughly enjoyed his experience and gratefully acknowledges the kindness with which he has everywhere been received. He is one of several distinguished international figures in chemical industry on whom the Society is bestowing its honorary membership. The others are Professor Fritz Haber (Germany), General Georges Patart (France), Dr. Takamatsu (Japan), an original member, Mr. H. W. Matheson (Canada), Dr. Heinrich Schicht (Czecho-Slovakia), Professor Sorensen (Denmark), Professor M. G. Levi (Italy), Dr. G. Engi (Switzerland) and Señor A. Maria Llopis (Spain). Among the American visitors one noticed Professor Hugh Taylor, Professor Jackson, Dr. W. A. Noyes, Mr. Schnell, and Professor E. Emmot Reid.

DR. LEVINSTEIN,
SOCIETY MEDALLIST AND PAST PRESIDENT.

SIR HARRY MCGOWAN,
PRESIDENT 1930-31.

[*The Chemical Age Photographs*]

PROFESSOR G. T. MORGAN, F.R.S.,
PRESIDENT 1931-32.

Opening of the Chemical Plant Exhibition

Speeches by Sir H. McGowan and Dr. Bush

THE British Chemical Plant Exhibition was formally opened on Monday morning by Sir Harry McGowan, President of the Society of Chemical Industry, and Chairman of Imperial Chemical Industries, Ltd. Dr. H. J. Bush, Chairman of the British Chemical Plant Manufacturers' Association, the organisers of the Exhibition, presided, and the platform party consisted of Dr. E. F. Armstrong, Chairman of the Association of British Chemical Manufacturers; Mr. George Gray, Chairman of the Chemical Engineering Group; Dr. H. Levinstein, Chairman of Council of the Society, and Mr. J. Arthur Reavell, late Chairman of the British Chemical Plant Manufacturers' Association and past President of the Institution of Chemical Engineers.

There was a packed attendance of distinguished representatives of science and industry, among whom were :—Mr. Eustace Alliott; Mr. Horatio Ballantyne; Dr. S. G. Barker, Director of The Wool Research Association; Mr. H. Bradley, Director of The Boot Research Association; Mr. W. A. S. Calder, President of the Institution of Chemical Engineers; Dr. G. C. Clayton, President of the Institute of Chemistry; Sir Arthur Colefax; Dr. R. T. Colgate; Dr. W. Cullen; Professor F. G. Donnan; Dr. A. E. Dunstan; Professor W. E. Gibbs; Sir Robert Hadfield; Professor G. G. Henderson, President of the Chemical Society; Dr. L. A. Jordan, Director of The Paint Research Association; Mr. J. Kewley, President of the Institution of Petroleum Technologists; Dr. L. H. Lampitt; Mr. C. Le Maistre; Dr. D. Jordan Lloyd, Director of The British Leather Manufacturers' Research Association; Lord Melchett; Mr. Robert Mond; Mr. Emil Mond; Sir David Milne Watson; Professor G. T. Morgan; Sir Frederic Nathan; Dr. W. R. Ormandy; Mr. J. G. Pearce, Director of The Cast Iron Research Association; Dr. R. H. Pickard; Mr. B. D. Porritt, Director of The Rubber Research Association; Dr. F. L. Pyman; Eng.-Capt. J. Fraser Shaw of The Fuel Research Board; Dr. R. Seligman, President of The Institute of Metals; Sir Frank Smith, Secretary of the Department of Scientific and Industrial Research; Dr. R. E. Stradling, Director of The Building Research Association; Dr. A. J. Underwood; Mr. Donald Van den Bergh; Mr. W. J. U. Woolcock, etc.

The Idea of the Exhibition

The Chairman, in his opening remarks, said :—When the Congress of Chemists was held in London in 1926, the British Chemical Plant Manufacturers' Association took the opportunity of staging an exhibition of chemical plant in the basement hall of this building, in order that the many hundreds of visitors to the Congress, most of whom were connected with the Chemical Industry in one way or another, might judge for themselves as to the excellence of British plant and of British materials for plant construction. That Exhibition was so successful that the Association decided to stage another whenever a similar opportunity should occur. We have had to wait five years but the wait has been well worth while, since it has given us an absolutely unique and unrivalled occasion for showing what the British Chemical plant industry can do. The British Chemical Plant Manufacturers' Association has concentrated on the trade side, with the object of showing the various types of plant, apparatus, constructional materials and general equipment available in this country for the chemical industry and the numerous branches of industrial activity associated with it. We have purposely limited the Exhibition to British manufacture, and we laid down as a definition for " British " that at least 75 per cent. of the cost of production of the article must represent British (which includes Empire) labour and/or materials. This is a more stringent requirement than that of the British Industries Fair, which calls for a minimum of only 51 per cent. We have made a special point of novelties, which we defined as any new design, material, method of construction, etc., which either had not been exhibited before or had been exhibited only within the past 18 months. In this way, we hoped that the Exhibition would make a special appeal to those who are in search of new ideas and new types of equipment.

The Chemical Engineering Group has concentrated on the non-trade or research side, and has staged, with the help of the Department of Scientific and Industrial Research and the Research Associations, a co-operative display to demonstrate the important part science is playing in the development of British industry and in the control of its production, and the painstaking and efficient technical work which lies behind all modern progress. Many of the exhibits will be on show for the first time, and should throw a flood of light on the invaluable work which the Department and the Research Associations are doing in advancing the progress of British industry.

Sir Harry McGowan's Address

In declaring the exhibition open, Sir Harry McGowan said :—I regard it as a privilege to be allowed formally to open this Exhibition of British Chemical Plant. I wish to thank those who have been responsible for the planning of this Exhibition, for their courteous and gracious action in so arranging it as to fit in with and be an essential part of the Jubilee Celebrations of the Society. You, sir, have told us of the inception of this Exhibition. To-day's achievement is, as you say, the result of co-operation between your Association, the Department of Scientific and Industrial Research, and the Chemical engineering Group. I hope that the happy result of this co-operation is an earnest of continuing and developing team work by these bodies.

Fifty Years of Progress

The Society of which I have the honour to be President celebrates this week the fiftieth anniversary of its birth. These fifty years have been fruitful years in the field of applied chemical science. During last century the great effort in chemical industry was towards the improvement of processes for the manufacture of products which were used in the making of necessities of human life—for food, clothing, housing and cleanliness. With the steadily growing wealth of the civilised world, demands sprang up for the supply of secondary needs. These in time became necessities—variety in food, colour in clothing, better houses with more windows, improved means of transport, newspapers and so on. These new demands affected the chemical industry. Since the war there has been an intensification of demand for these secondary needs and for luxuries. For examdle, the demand for cotton and woollen goods has been affected by the demand for artificial silk. The silk stocking has become a necessity. The growth in the demand for motor cars, the increasing development of air transport, all bring a certain amount of grist to the chemical mill. The old days of stability of demand have gone. More money is being spent on what are becoming new needs and demand is fickle and subject to fashion and caprice. This constantly changing and widening demand for products affects the chemical industry more perhaps than any other and, therefore, inevitably it affects the chemical plant manufacturer.

The change in design and construction of chemical plant in the last generation shows vividly the progress that has been made in chemical manufacture. The development of high-pressure processes, for example, has brought about a revolution in the nature of chemical plant. The size of units has been increased enormously, and there has been continuous change in the composition of the plant material. The British chemical plant manufacturer, by his research, industry and enterprise, has made a valuable contribution to the industrial progress of this country. I have on other occasions referred to the co-operation of the chemist and the engineer. The chemical engineer has a far more difficult and in some respects more baffling task than most other members of his profession. The chemist is constantly presenting him with new and difficult problems, which he tackles with great effort and ingenuity, and solves with remarkable success.

Life of Plant Curtailed

One result of the fickle character of present-day demands and the rapid advance in technique which accompanies it is that the effective life of plant is being drastically curtailed. It very often happens that the value of a plant has to be written off long before its physical life is exhausted. This problem of

obsolescence is one that exercises the mind of every manufacturer to-day. In our own industry it is a problem for the solution of which we must call for the co-operation of the plant manufacturer.

In the case of articles supplied direct to the consumer, it is possible to meet a fickle demand by decreasing to a certain extent the durable life of a product, but in the case of chemical plant there can be no tampering with quality. The very nature of present-day chemical manufacture calls for new and ever-improving constructional material. The cost of plant, therefore, is becoming a factor of increasing importance to the chemical industry and to the many others in which chemical processes play an important part. They *must* have the very best plant material and yet, in the nature of things, few industries require new plant more frequently. The problem for the chemical plant manufacturer is how to give the chemical manufacturer cheap plant of good quality.

This need for more rapid obsolescence of plant can be met only from the reserves built up for the purpose inside industry.

The Burden of Taxation

I have no intention of entering the arid field of politics. We have more than enough of politics, but it is becoming increasingly clear that the present heavy burden of taxation is so reducing the power of industry to build up reserves to meet obsolescence that development in the future will be seriously impeded. The burden of taxation is such that the investor is apprehensive of a suitable return on new investments. This inevitably affects development. That there are economies, and great economies, that can be achieved in government expenditure is obvious to any impartially-minded individual. On the other hand, there are certain liabilities for social services which few can seriously contemplate being cancelled. The position is a grave one and criticism founded on mere party prejudice is of little value. The country, however, must face the fact that taxation on the present high level will dry up the sources of capital available for the development of industry. Without development and growth there must be death.

Five years have gone since the last exhibition of this kind was held in this country. Five years is a long time. It is the lifetime of some plants. In five years some of the plant exhibited here may be completely out of date. We rightly pride ourselves on the quality of British goods. At the same time we are rather apt to overstress the importance of solidity in our works construction. We have to take a lesson from the United States and be prepared for what to our predecessors would have appeared ruthless and extravagant scrapping. The cost of the product of the plant manufacturer is a vital factor in this matter, but if by means of cheaper plant the various industries can be induced to keep themselves completely abreast of the latest developments, there would inevitably be increased turnover for the plast manufacturer.

Changes of the Future

Though there have been many changes and new developments in the last few years, we must envisage more rapid changes and faster developments in the future. There is this difference between the industries which use chemical plant and most other industries, that whereas in their case there is little likelihood of more than refinements being evolved, there is no foretelling when a new chemical process revolutionary in its effect may be discovered. There are now chemical processes being worked out which will in some cases replace staple natural products. There may be some which will conceivably change the nature of the clothing of the civilised human being. It is possible that the present normal food of humanity may be replaced by some synthetic chemical product. The possibilities of the future are staggering to contemplate, and it is only by the still closer welding of the sciences of chemistry and engineering that these possibilities can be brought to a profitable outcome. For that reason I welcome the holding of this exhibition at the present time. A courageous effort has been brought to a successful conclusion. The chemical plant manufacturers, the chemical engineers, and the Department of Scientific and Industrial Research have shown us the better way in a time of commercial depression. Hard work, inventiveness and enterprise are needed now more than ever in this country. To-day we see how one branch of industry at least has prepared itself for the time which is bound to come when the trade of the world will recover. (Applause.)

A hearty vote of thanks to Sir Harry McGowan was proposed by Mr. J. Arthur Reavell, who emphasised the fact that the British Chemical Plant Manufacturers' Association stood for British-built plant. "We have kept the flag flying for many years," he said, "and are proud to state that this country is able to produce chemical plant equal to, if not better than, any that can be produced anywhere else in the world."

Plant Manufacturers' Luncheon

Following the opening ceremony, there was a luncheon at which Sir Harry McGowan proposed the toast of the British Chemical Plant Exhibition. "The exhibition," he said, "reflects the greatest possible credit on its organisers, and I should like to compliment them on their achievement. The exhibition in its range and variety challenges the finest exhibitions abroad, such as the Achema held at Frankfort last year. It should arouse great interest throughout all the industries where chemical processes are employed. Artificial silk, brewing, dairying, rubber, sugar, soap and petroleum—all these industries will find exhibits of great interest to them. At the risk of repeating some of the things I said at the opening ceremony, I would like you all to cast your minds back over the past fifty years. What will strike you most are the remarkable developments that have occurred in the field of applied chemical science. The significant point which emerges is that the application of chemical science has resulted in the creation of new industries and great industrial developments which have found employment for thousands of workers. Looking ahead, I am convinced that it is in the chemical field that the great discoveries of the future will lie, and that on chemical science depends the revival of our older industries and the discovery of new lines of industrial enterprise. But chemical discoveries and inventions by themselves are not enough; they must be applied, and that application often requires greater expenditure of effort than the discoveries themselves, and is often of equal importance. The essentials for the economic development of a process are the close co-operation of the chemist, chemical engineer, and the manufacturer of chemical plant. Unless the complicated problems of heat exchange, corrosion, etc., can be solved, the most epoch-making discoveries may remain merely as laboratory achievements. Therefore if we are to lead in the field of chemical science we must see not only that our research activities are adequate, but that we have an efficient industry capable of designing and manufacturing the equipment necessary to convert laboratory discoveries into industrial operations. The industry cannot, however, be maintained in a state of steady progress unless it is loyally supported by all users of chemical plant. Therefore I make a special plea in the interests of the future prosperity of this country and our Empire, that we support our home industry."

Dr. Bush, in his reply to the toast, said: "What we are out to do at the exhibition is to show that this country can supply chemical plant and equipment for every conceivable purpose and of the highest quality and efficiency, and that we can equal the best that any other country can produce. I feel sure that we shall be able to convince you of this, and having convinced you, we would ask you on all occasions to buy British, and in this way do something to encourage the development of a vital British industry, and incidentally to reduce the burden of our unemployment."

Mr. George Gray, director of the Chemical Engineering Group, also replied.

A Treasure of Old London

It is not often that a journal strictly concerned with the day-to-day affairs of an important industry can find an opportunity of asking its readers to put aside for an hour or so the cares of business. But the restoration, at the charge of Sir Ernest Benn, of the fascinating old Parish Registers of St. Dunstan's-in-the-West, Fleet Street, which will be exhibited at the offices of this journal from 4 to 6 p.m. next Wednesday, gives us this unusual privilege. We, therefore, have great pleasure in renewing to our friends and subscribers who care for the historical associations of old London, a cordial invitation to join us at tea and spend an hour or so in examining the restored volumes. We make only the request that those who desire to be present should inform the Editor or Sir Ernest of their intention to attend.

Notes and Impressions on the Exhibition

I.—By P. Parrish, F.I.C., M.I.Chem.E., M.I.Gas E.

It is unfortunate that the Exhibition of British Chemical Plant and Apparatus, which has been held during the current week at the Central Hall, Westminster, in connection with the Jubilee celebrations of the Society of Chemical Industry, should synchronise with one of the worst periods of industrial depression on record. There has been a marked absence of orders for chemical plant during the last six months. Under such conditions chemical plant manufacturers have inevitably been called upon to make an important decision. Should they economise expenditure, or should they adopt a courageous policy, and advertise and exhibit their plant and apparatus?

The exhibition is at once an evidence of a justifiable belief in the merits of English chemical plant and apparatus, and in world trade recovery. It has not been organised on the scale of the Achema. This was hardly to be expected. It is, however, impressive in at least three ways. That part of the exhibition which consists of plant, materials and apparatus illustrating research in industry is an innovation of the first order. That it was organised by the Chemical Engineering Group is peculiarly appropriate. Secondly, the exhibition constitutes a striking evidence of the advance that has been made in materials of construction, such, for example, as stainless steels, nickel-chromium alloys, pure nickel plant, special Bakelite mouldings for acid resistance, aluminium alloys, Monel metal, Alpax and Batterium metal (a copper-aluminium-nickel alloy), and thirdly, there was someone at most of the stands who was an expert technician, and knew the merits of the exhibits, and could discuss the whole gamut of the subject in a skilful and intelligent way.

Certain features that one expects at an exhibition of this kind were largely absent. No firm displayed homogeneous lead linings, or rubber, or treated rubber, linings, and there was no equipment exhibited relating to automatic control methods, which have developed rapidly in America and Germany during the last five years, and must be adopted by the chemical industry in this country, if chemical plant is to be worked economically.

Some Leading Features

Mention can appropriately be made of some of the exhibits which, for reasons of novelty, utility or outstanding merit, are likely to command early consideration by the chemical industry.

Aluminium is likely to prove of real service for bulk transport. This merit lies in its suitability for the conveyance of many chemical products, such as nitric acid, petroleum, acetic acid, tar, tar oils, milk and beer. By reason of its lightness, the chassis can be constructed at such a price that the composite equipment is cheaper than a chassis which is used to carry a steel tank. Moreover, as a twenty per cent. greater useful load of product can be carried with an aluminium vessel, the cost of transport must be reduced appreciably. It is claimed that Birmabright is two and a half times as strong as pure aluminium, and only one-third the weight of steel.

Aluminium does not cast well: one finds not a few blowholes. This difficulty has been overcome by the addition of silicon. One such aluminium-silicon alloy—Alpax—contains something of the order of 11 per cent. of silicon. It is a much harder material than aluminium, and possesses a high tensile strength; its resistance to corrosion is almost equal to that of aluminium. The addition of silicon is known to give a finer grain.

English manufacturers can produce high pressure reaction vessels (bombs) of excellent material and form, and indeed can challenge any other country of the world in this respect. The exhibit of Hadfield's, of Sheffield, was striking in this connection.

Acid manufacturers who have experienced trouble either with the corrosion, or with incipient porosity, of the arms of their mechanical pyrites or spent oxide burners, cannot do better than give "Era" H.R. steel a trial. This is specially made, and has excellent heat resisting properties, and possesses superior mechanical strength at high temperatures.

Increasing attention is being given to heat interchangers, as evidenced by certain exhibits. The Aluminium Plant and Vessel Co., Ltd., displayed a heat interchanger of a novel type, which had been developed in the dairy industry for pasteurising milk. The chief feature of this type of interchange heater was the ease with which it could be dissembled for cleaning. Naturally, an apparatus of this kind has manifold applications, and it is certain that its use will extend.

"Era" and other such steels are being increasingly used for furnace regenerator tubes with marked success.

The welding of stainless steels up to a year or so ago was accompanied by the formation of "bands" on either side of the weld, which were peculiarly susceptible to attack, unless the whole vessel was subjected to a subsequent annealing process. It is interesting to observe that with F.D.P. metal this difficulty has now been overcome, and satisfactory welding can be effected without metal fatigue, and with the retention of all the corrosion-resisting properties.

One of the exhibits of Grant and West, Ltd., calls for comment: it was a chromium-nickel-steel casting, consisting of 18 per cent. chromium and 8 per cent. nickel, having a tensile strength of 40 tons per square inch, and an elongation of 44 per cent. It was claimed that a rod cast of this material could be doubled at least nine times without revealing any fracture. Castings of this material are bound to prove advantageous for dealing with ammoniacal liquor, sea water, brines and cooling waters, which are known to have corrosive properties.

New Enamelling Developments

A new development in the enamelling of vessels must be noted. This relates to the enamelling of mild steel as distinct from cast iron. T. and C. Clark and Co., Ltd., of Wolverhampton, are responsible for this innovation. The excellent high silica enamelled vessels of the Cannon Iron Foundries, Ltd., were observed, and it was learned that they had supplied large enamelled catalyst vessels for ammonia oxidation to several important chemical undertakings.

An improvement in the ordinary acid egg is to be found in the exhibit by the Tungstone High Pressure Machine Die Casting Co. The principal features of their equipment, which is virtually a pump, are the absence of any moving or rotating parts in contact with the liquid to be handled, and the fact that the pump can be constructed in practically any material to suit the particular liquid to be dealt with. Moreover, the continuity of the pumping offers a special advantage, and must simplify the circulation of acid on sulphuric acid plants, where, through considerations of size of plant, it has been deemed inadvisable to install mechanically operated pumps. The absence of glands, its compactness, the small space required for accommodating it, and not less so the simplicity and flexibility of this equipment, must prove a source of attraction in connection with many pumping propositions.

The "Easifilt" filter, as exhibited by Manlove, Alliott and Co., Ltd., is a development of the vacuum leaf type filter. It is especially suited to handling cakes which cannot be discharged from the leaves by air pressure, and there are many purposes to which it can conceivably be applied with advantage. It is very compact, and lends itself to washing, steaming or air drying of the cake.

An interesting Monel metal gauze, of exceptionally fine mesh, was exhibited by G. A. Harvey and Co. (London), Ltd. It is felt that a gauze of this kind must have many applications in connection with filtering problems.

The Kestner dryer and oil-heating equipment excite favourable comment. The E.M.S. dryer has been designed essentially to deal with materials that contain only a small percentage of water, and are therefore largely immobile. The dryer ensures thorough mixing of the material as it passes across the drying machine, and suitable arrangements are provided for regulating the temperature and the rate of output.

The Kestner "Vortex" stirrer is bound to find many applications. The stirrer is suspended from a single flexible bearing, outside the vessel. The circulation is two-fold, being upwards and lateral, so that efficient mixing is obtained in a minimum of time.

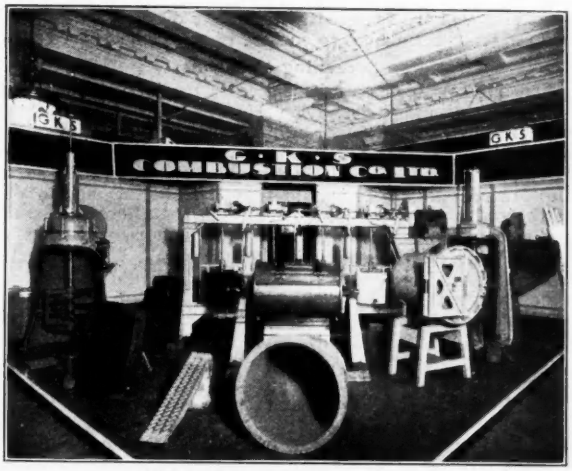
It was evident, from the exhibits of this stand, that the Kestner-Merrill system of fluid heat transmission is rapidly

British Chemical Plant Exhibition, 1931

A Selection of Stands

(Specially photographed for "The Chemical Age" by F. A. Swaine, London)

GEORGE SCOTT AND SON (LONDON), LTD.



G.K.S. COMBUSTION CO., LTD.

TUNGSTONE PATENT HIGH PRESSURE DIE CASTING CO.

S. H. JOHNSON & CO., LTD.

CANNON IRON FOUNDRIES, LTD.

A. GALLENKAMP & CO., LTD.

developing, and that it will be applied in an increasing number of directions. It is suitable for the distillation of glycerine, tar, tar oils, and indeed any heating problem where uniform temperatures are required below 400° F. Where higher temperatures are called for, advantage can be taken of the Kestner pyrolene high temperature heating plant. This is a speciality which has recently been put on the market, and enables temperatures up to 700° F. to be attained.

Screening Problems

Screening problems are becoming increasingly numerous in a variety of industries. The Huntington-Heberlein latest type of all-steel jigging screen merits attention. The salient feature of this screen is the peculiarly simple method of driving, which is effected by means of the revolution of an unbalanced pulley. It is said that the grading efficiency is of the order of 95 per cent. The " H.H." vibrating screen was also shown, in the form of a small model screen.

The exhibit of the Mond-Nickel Co., Ltd., was distinctly attractive, and represented the standard which should be aimed at by exhibitors. The technical literature which was available, no less than the unrestrained disclosure of information, was to be admired.

The Knowles hydrogen cell, as displayed by the International Electrolytic Plant Co., was a feature of attraction. The Knowles cells, for the production of electrolytic hydrogen, have gained in popularity during the last few years, and are now competing successfully with the Fauser and Pechkranz types.

Silica Gel

Few of the exhibits were more interesting than those concerning the use of silica gel. Its industrial value is being more and more appreciated, and its applications are growing daily. The exhibits of Silica Gel, Ltd., and the Kestner Evaporator and Engineering Co., Ltd., were certainly attractive. The immense number of pores which this material possesses renders it suitable for the adsorption of a large number of vapours, for the dehydration of gases, and for the purification and drying of oxygen, carbon dioxide and other gaseous products of this type.

It is impossible, in an article of this kind, to mention all the exhibits. The continuous self-discharging centrifugal separator of Broadbent, Ltd., of Huddersfield; the Wikner tar dehydration plant; the Taylor benzole process; and the K. and E. process of dephenolating ammonia liquors, of W. C. Holmes and Co., Ltd., of Huddersfield; the machines and processes for the continuous agitation, classification, thickening, washing and filtering of a great variety of liquids, which are specialities peculiar to the Dorr Co., Ltd.; the Rapid sifting and mixing machines of Gardner and Co., Ltd., of Gloucester; the tower packing rings of the Hydronyl Syndicate, all call for comment. It will be appreciated, however, that these impressions must necessarily suffer from the defects incidental to a necessary compression.

A Co-operative Effort

The exhibition has involved co-operative effort on the part of many bodies, not the least of which are the British Chemical Plant Manufacturers' Association, the Department of Scientific and Industrial Research, and various research organisations. The underlying intention has been to exhibit typical British chemical plant and apparatus, and it is to be hoped that the response has been such as will encourage not only a continuance of these exhibits at suitable periods in the future, but will stimulate those concerned to organise on a larger scale.

Even to-day many chemical manufacturers have not taken advantage of the ever-growing variety of new materials which are available for the construction of chemical equipment, nor have they installed the most modern processes. When industry is so gravely depressed as at present, it is opportune to replace obsolete plants, and to introduce modern equipment, in order to fortify one's position when the revival of trade arrives.

II.—By Arthur Grounds, B.Sc., A.I.C., A.M.I.M.E.

THERE is an old Gaelic proverb which says: " The man who will not sow on a cold day will not reap on a warm one." This saying might very well have inspired the work of the British Chemical Plant Manufacturers' Association, for in spite of all the cold atmosphere of depression which is so evident in every industry, a visit to the present Exhibition at the Central Hall, Westminster, convinces the most profound pessimist that British manufacturers of chemical plant are sowing the seeds which will undoubtedly mature, if not in the immediate future, at least when trade resumes its normal march. Everywhere there is evidence of intensive research into the present-day problems facing the chemical industries, not only of research, but also of the application of the results of such research to the solution of problems which have arisen.

It was a happy thought which decided the organisers of this Exhibition to include among their exhibits some special sections organised by the Chemical Engineering Group. These sections demonstrate how the numerous problems in chemical engineering have been studied. First of all, the fundamental reactions or data have been established, and then units have been designed in which these reactions can be conducted, or materials have been developed which will stand up to the special stresses and strains to which they will be subjected. An examination of this part of the Exhibition leads to a greater appreciation of the enormous amount of chemical research and mechanical skill in designing plant which lies behind the exhibits of actual plant.

Showmanship

It was at one time taken for granted that a weak point of chemistry as a whole was the aloofness and lack of " showmanship " on the part of the chemical industry, an omission which led to insufficient appreciation of what the plant manufacturer was able to offer to the industry. This complaint can no longer be justified. A tour of the Exhibition will immediately draw the attention of the observer to the considerable use which is now being made of two methods of publicity, namely, advertising and the use of model plant, and there is ample evidence that the trade literature on chemical plant can be made to look quite atrractive and can be the cuase of comment by those outside the industry.

In an Exhibition of this sort, no matter how large a hall is secured for the purpose, it would be obviously impossible to show complete large units such as roasting furnaces or a Dorr thickener or classifier. The alternative means at the disposal of exhibitors is to show either photographs or scale models of the plant. Photographs are excellent in their way, but can only show one aspect of the particular machine, while if it is desired to show a complete layout for a certain process, including a number of machines, the photograph loses in value owing to the relatively small size of each machine included in the view. With a scale model, however, one can visualise exactly what the industrial plant will look like, and one can study the arrangement of the various units comprising the whole. Such models have been used to a large extent in this Exhibition by firms such as Industrial Waste Eliminators, Ltd., who show a complete Iwel-Laabs offal treatment plant; the Dorr Co., Ltd., who show a complete phosphoric acid plant (a particularly clever model); and Huntington, Heberlein and Co., Ltd., who show models of their screens, washing tables, and roasting furnaces. A large number of photographs are also on view, many firms being only too anxious to show what a wide range of application is possible with their products. The various steel-producing firms, for instance, have gone to a good deal of trouble in this direction, while added charm is given by illuminated transparencies, such as are shown by the Mond Nickel Co., Ltd., and Hadfields, Ltd. A further demonstration of the willingness of firms to aid the possible client in visualising the action going on within their machines is afforded by the exhibit of a rotary dryer shown by Manlove and Alliott. This dryer has been provided with a complete sheet of glass covering one end, so that the visitor can see for himself the manner in which the product being dried is showered through the stream of hot gas in its passage through the dryer.

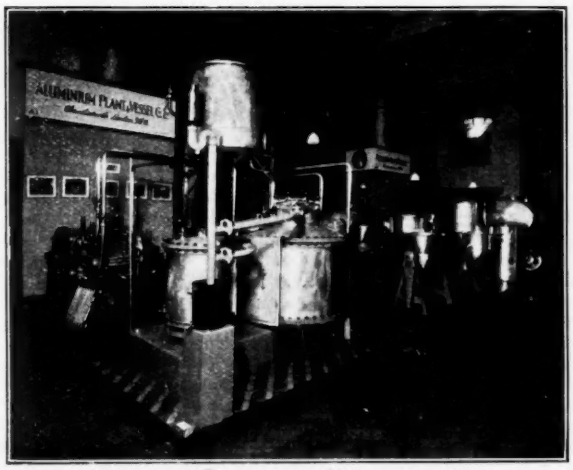
Steel and Nickel

Prospective customers are sceptics at the best of times, but in order to avoid any question of " taking the salesman's word for it," Hadfields, Ltd. and Thos. Firth and Sons, Ltd., have prepared test vessels showing immersion test pieces of their special steels in liquids of varying corrosive activity. This is

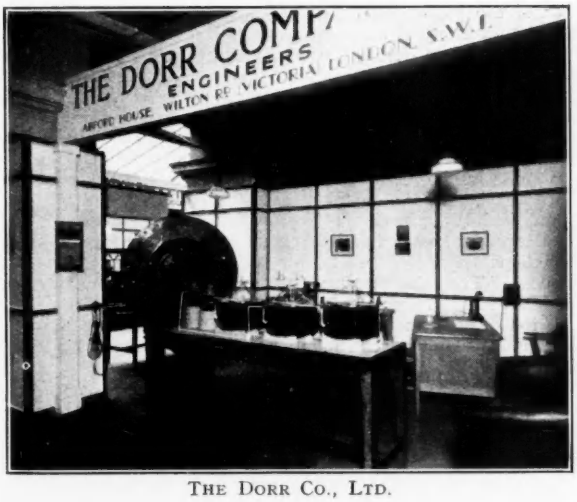
British Chemical Plant Exhibition, 1931

A Second Group of Stands

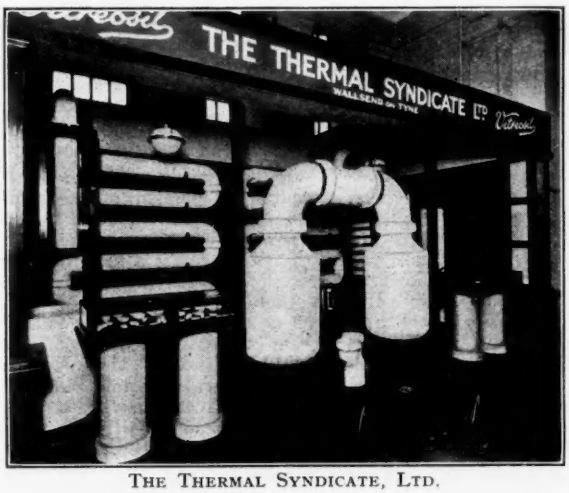
(Specially photographed for "The Chemical Age" by F. A. Swaine, London)



ALUMINIUM PLANT AND VESSEL CO., LTD.



THE DORR CO., LTD.



THE THERMAL SYNDICATE, LTD.

BIRMAL CHEMICAL ENGINEERS.

HAUGHTON'S PATENT METALLIC PACKING CO., LTD.

KESTNER EVAPORATOR AND ENGINEERING CO., LTD.

a happy combination of industrial production with laboratory testing demonstrations. Another complaint often laid at the door of the chemical plant industry is that the industry is too insular and does not adapt itself enough to the search for fresh outlets for its products. That this complaint is unjustified is evidenced by a visit to many stands, as, for example, that of the Mond Nickel Co., Ltd., where the application of nickel to a hundred and one industries is demonstrated.

Hadfields, Ltd. and Thos. Firth and Sons, Ltd., also show how their special steels can be used for a wide range of purposes; the products of Brown Bayley's Steel Works, Ltd., are treated in a similar manner. These firms, not content with the adoption of their steels by the chemical industry, have secured the use of steels such as Staybrite and the special Era steels in shop front fittings, hardware, and other products quite apart from the chemical industry itself. They have also abandoned the practice of merely saying, in effect: "Our steels are the best," and have gone out of their way to show the client *why* their steels are the best for any particular purpose. They show examples of the use of an ordinary steel, for example, in a spring-heating furnace, which steel, after a period of only one month, was badly corroded and unfit for further use, while a rack made of special heat-resisting steel, used under identical conditions, is still as good as the day it was made after eighteen months' hard service. Another exhibit which is rather surprising is that of G. A. Harvey and Co., Ltd., who are well known as makers of perforated metal sheets and pressed steel work.

The Appeal to the Layman

The Exhibition in many of its aspects is not devoid of interest to the layman, for manufacturers of British chemical plant are very much alive to any opportunities which may present themselves to-day. While walking round quite a number of German visitors and a sprinkling of American visitors were noticed, and it is a matter for congratulation that the exhibitors have thought fit to set a high standard of salesmanship. On many stands conversations were in progress in languages foreign to this country, an occurrence which is not usually noticed at the majority of trade exhibitions, and which in this instance shows that some far-reaching business results may be anticipated.

Considering the unsatisfactory nature of the hall it is a highly satisfactory display, and with the limited space at their disposal the exhibitors have put up a thoroughly good display. The connecting link between the laboratory and the works is furnished by one firm of laboratory outfitters, who have made a special point of showing small semi-industrial units in which proposed processes can be "tried out" on a larger scale than is permissible in the laboratory, without the expense of building an actual large-scale plant. In all chemical engineering work accurate measurement is a necessity, and the various scientific instrument makers are in the fortunate position of being able to show to the industry the exact instrument which they are able to offer for any particular purpose. There is, however, one suggestion to make to the producers of special alloys and steels. We know that they can supply us with the material we want, but will they, on their part, encourage the use of such special materials by giving us prompt delivery?

The Exhibition, considered as a whole, creates a very favourable impression, and it is to be hoped that the energy and thought which has been expended on its organisation will be rewarded by an ever-increasing appreciation of the rôle which the chemical engineer plays in British industry, and by an extended application of the materials and machines which are now available.

Fluid Heat Transmission up to 780 F.

Kestner Evaporator and Engineering Co., Ltd.

THE Kestner "Pyrolene" heating system for high temperatures up to 780° F. is an entirely new system shown on Stand B17. In the chemical industry high temperatures are required in a great many processes and of late years the tendency has been towards still higher temperatures. Steam has generally been adopted as a means of transmitting heat, but with this increase in temperature, the pressures become so high that the cost of construction of the various apparatus is almost prohibitive. In order to meet this condition, Kestner's have been supplying their well-known patent Kestner-Merrill system of fluid heat transmission which has successfully solved the problem of obtaining temperatures up to 600° F. Recently, however, there has been a demand for even higher temperatures than can be produced by the "Merilene" system, and with the new "Pyrolene" system temperatures up to 780° F. are obtainable.

The chief advantage of this system is that the heat can be applied either by circulating the Pyrolene as a liquid, or in the vapour phase, according to requirements, but it is preferable to work in the vapour phase, in order to obtain the heat transfer coefficient of the condensing vapour, which is much higher than that of the liquid. The absorber can be heated by means of oil, gas or electricity, whichever is the most convenient, and special automatic controls are arranged to cut off the fuel or electric current in cases of interruption in the circulating system, so that the complete installation is almost foolproof.

A Wider Range of Sizes for Vitreosil Plant

Thermal Syndicate, Ltd.

A VERY fine display of pure fused silica, manufactured under the name of Vitreosil, is shown by the Thermal Syndicate, Ltd., of Wallsend-on-Tyne, at Stand No. A10. Here are exhibited the latest arrangements of a 2½-ton Vitreosil plant for the manufacture of synthetic hydrochloric acid, in which a column of Vitreosil adsorption vessels is included.

Great progress has recently been made in the manufacture of large Vitreosil pipes which are now available up to 7 feet in length and 12 inches internal diameter. Containers of 108 gallons capacity, measuring 4 ft. 6 in. in height and of 2 ft. 6 in. internal body diameter are also obtainable. Two of these containers with an inverted U-bend present an impressive appearance at the entrance to this stand, where there is also to be seen a valveless pump for raising acids and similar corrosive liquids. The cylinder and plunger of this pump is constructed entirely of Vitreosil, so that corrosion by acid is entirely obviated, and the pump is of sufficient capacity to raise 150 gallons of water per hour, against a head of 40 ft. There is also shown a Vitreosil water-generated gas ejector pump, and a Vitreosil air lift pump.

A Vitreosil condensing coil is another interesting exhibit. These coils can be used for the condensation and cooling of nitric, hydrochloric, acetic and other acids. The successful use of Vitreosil here is due to its acid-resisting and heat-resisting properties, being absolutely unaffected by the acids named at any strength or temperature, in addition to which it does not disintegrate. In operation such coils are usually water-cooled, and are fitted with teak or other suitable wooden supporting frames; but where it is desired to heat the coil externally, cast-iron supporting frames can be supplied.

Drying Stoves on the Unit Principle

L. A. Mitchell, Ltd.

MITCHELL drying stoves have been employed for a number of years in the treatment of foodstuffs, colours and dyestuffs, and it has been proved that their operating costs are very low. The chief exhibit shown by L. A. Mitchell, Ltd., of 37, Peter Street, Manchester (Stand No. B.28) is, therefore, one of their drying stoves which are built on the unit system so that they can be very easily extended when required. These stoves can be operated at half capacity without any loss of efficiency or increased specific fuel consumption. They can be operated at any temperature from atmospheric upwards, and rapid, uniform and economic drying is assured, and can be heated either by steam or electricity. The "Mitchell" drying stove usually employs trays or shelves, and for this purpose a very superior quality of tray is used. These trays are coated with a special vitreous enamel which does not chip, and which gives an exceptionally long life to the tray. An illustration showing one unit of a large Mitchell drying plant, recently installed for drying pigments, was reproduced in THE CHEMICAL AGE, July 11, page 32. This dryer operates on a system of recirculation of the heated air, thus utilising

the heat to the fullest extent before being exhausted from the dryer to waste. It is a well-known fact that the ability of air to carry moisture increases with its temperature. By re-circulating the air the heat it loses in taking up moisture when passing over the material is regained when passing through the heater. The constantly re-heated air is thereby enabled to take up more and more moisture and is not exhausted from the dryer until the point of saturation is almost reached. The system of circulation operates continuously so that a small amount of fresh air is drawn in, and a portion of the air just before becoming saturated is exhausted to waste. In comparison with other drying systems these dryers compared with vacuum stoves generally give 50 per cent. reduction in drying cost, and also a more uniformly dryed and purer product—at a lower first cost, with less maintenance on upkeep and repairs.

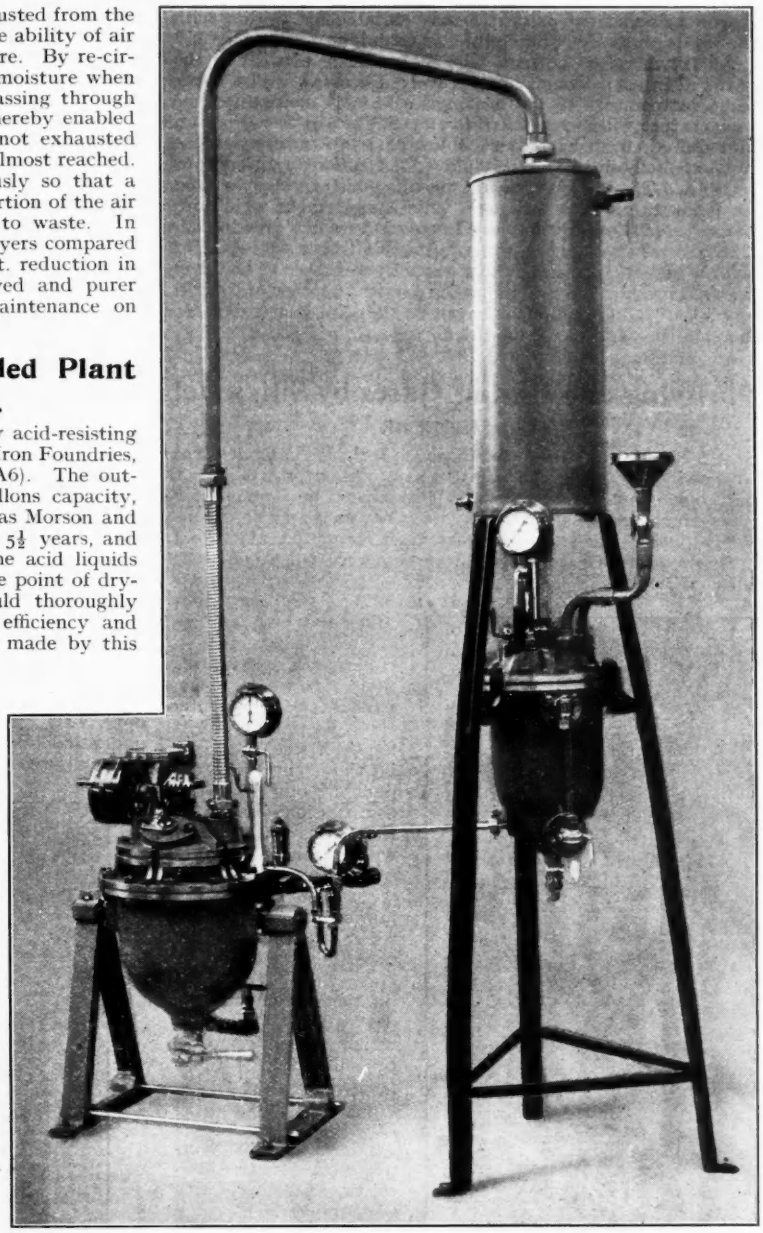
A Range of Cast Iron Enamelled Plant

Cannon Iron Foundries, Ltd.

CAST-IRON chemical plant lined with hard grey acid-resisting enamel is the keynote of the exhibit by Cannon Iron Foundries, Ltd., of Deepfields, near Bilston (Stand No. A6). The outstanding item is a large enamelled pan of 50 gallons capacity, temporarily removed from the works of Thomas Morson and Sons, where it has been in continuous use for 5½ years, and shows little, if any, evidence of attack by the acid liquids which have been evaporated in it almost to the point of dryness. A critical inspection of this pan should thoroughly convince possible users of the acid-resisting efficiency and non-cracking qualities of the enamelled plant made by this firm.

In former years it was necessary to go to the continent for very large vessels with acid-resisting enamel linings, but Cannon Iron Foundries have now installed a large enamelling muffle to deal especially with large scale work, and they are hoping that their enterprise in this direction will now enable them to attain a considerable proportion of the business which has hitherto gone abroad. The steam-jacketed mixing pan with dome cover, agitator, and enclosed gear, shown on their stand, is a typical instance, although size is here restricted by space available at the Exhibition. The body and cover of this pan is a remarkably clean casting; the protective enamel coating is carried over the flanges; and the enclosed gear is of an improved type.

The accompanying illustration shows one of the smaller items exhibited at this stand. It is a small-scale recovery plant for use in connection with synthetic resins. The steam-jacketed pan is of 1 gallon capacity, and is provided with agitator and stirring gear. The cover is secured to the body of the pan by means of swing bolts, and is readily removable for cleaning purposes. The jacket is fitted with steam inlet and outlet valves, and also water inlet and outlet valves, and the vessel as a complete unit is arranged to tilt, with a fitting for setting it in any desired position. The vapour outlet is provided with a flexible metallic tubing which is easily disconnected when it is desired to tilt the vessel. Coil condenser and receiver are supported on a separate tripod stand, and the draw off from the receiver has a special return fitting to the mixing pan, which is essential for experimental work. Both the mixing pan and the receiver are lined with hard enamel of acid-resisting properties.



SMALL SCALE RECOVERY PLANT FOR SYNTHETIC RESINS
(CANNON IRON FOUNDRIES, LTD.)

A New Drier for Non-Flowing Solids

Kestner Evaporator and Engineering Co., Ltd.

THE Kestner E.M.S. drier, exhibited by the Kestner Evaporator and Engineering Co., Ltd. (Stand B17) has been developed for handling dry materials such as filter press cakes, crystals, granular products, etc., which contain only a relatively small percentage of water and are handled in such a condition that they cannot flow. This drier was illustrated in THE CHEMICAL AGE, July 11, page 29. It consists essentially of a number of jacketed troughs, each containing a central stationary cylinder with special rotating blades revolving on the outside of the cylinder. The troughs are heated either by steam, direct fire, or by the Kestner patent "Merilene" system of fluid heat transmission, depending upon the particular method of heating that is most suitable. The internal cylinders may, if required, be heated in a similar way. The design is such that the material moves forward progressively from trough to trough and, at the same time, is kept in motion and agitated in each trough so as to have proper contact with the heating surfaces. A special feature of this agitation is the formation of a solid cylinder of material between each trough, which rotates in the opposite direction to the flow through the plant; consequently the material undergoes very thorough mixing ensuring uniform drying. For the same

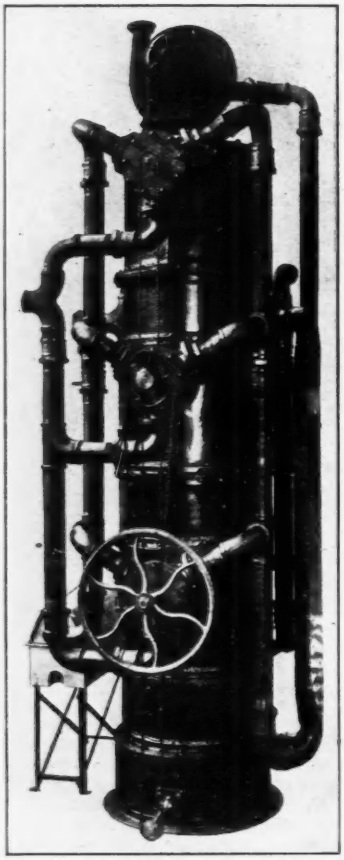
reason this machine is particularly suitable for dealing with materials normally liable to cake or form lumps.

It will therefore be seen that the moisture content of the material in each trough progressively decreases, whilst if the same temperature of the heating medium is maintained the temperature will increase as the material moves to the outlet. If required, in special cases, different temperatures for the heating medium may be employed on different troughs or sections. The material is fed to the plant through a feed hopper with an automatic feed valve arrangement which can be varied to suit the required rate of flow and gives a continuous output of dry product. Materials in a semi-solid or solid form can be dried to any desired percentage of water in the final product, depending on the size and number of troughs employed ; additional troughs can be added at a later date, to increase the capacity of the drier.

Purifying and Drying Gases by Silica Gel

Silica Gel, Ltd.

STAND No. B22, occupied by Silica Gel, Ltd., is chiefly devoted to showing the utility of silica gel as a means for drying and purifying compressed gases and also air. The demand for gases which are practically anhydrous has increased so extensively during the last few years that many manufacturers are now meeting it by using a pressure type silica gel dryer through which the gases pass before using them or when filling shipping containers.



SILICA GEL DEHYDRATION UNIT. (SILICA GEL, LTD.).

Contamination in compressed gases is due to lubricant vapours formed by the partial "cracking" of the lubricant in the compressor cylinders by heat of compression (except in the cases of oxygen, where oil lubrication cannot be used). This "cracking" of the lubricant occurs even when the best high-proof lubricant is used, and the "cracked" products give the gas a "musty" odour, which is removed by silica gel. Compressed air, for example, is always saturated with atmospheric water vapour at the temperature of the receiver, together with vapour derived from the lubricants. When the receiver following the compressor is over-size and the pipe-line to the point of use is a long one equipped with settling traps, most of the water and oil mist will be removed, but this condition is seldom found. The mist is carried along in the air and is added to the vapour which condenses as the air expands upon using, which increases the fog or frost formed at the exhaust. The simplest and most efficient way to remove these vapours is to insert a suitable silica gel equipment in the compressed gas or charging line. A receiver or moisture trap does not, and cannot, take out any true vapours, and it is only partially efficient in removing the condensate of compression and mechanically-entrained mist. Consequently, all the vapours and some of the mist pass on into the shipping cylinders unless the protection of a silica gel adsorption unit is provided.

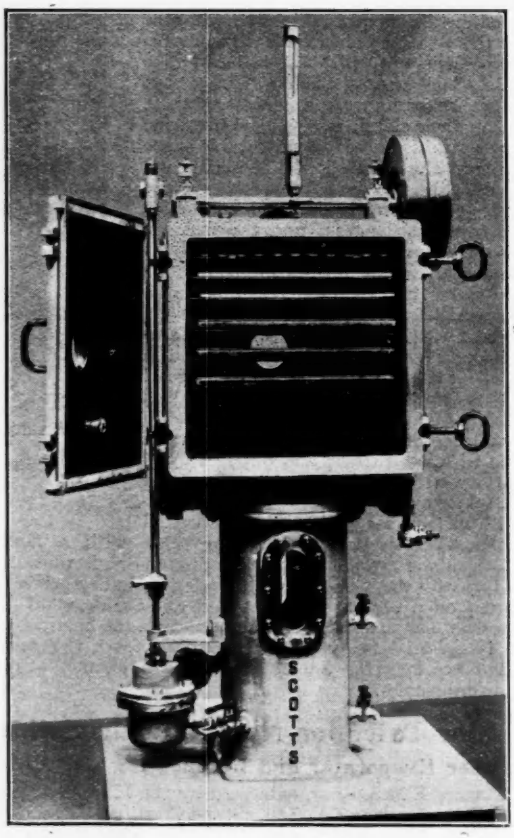
In the case of carbon dioxide gas used for carbonating beverages and similar purposes, the traces of disagreeable smell and flavour, characteristic of either fermentation of combustion-produced gases, are especially objectionable. Here the silica gel process is unique in that it not only removes objectionable odour and taste, but simultaneously reduces the moisture content to a point where no freezing difficulties are encountered when operating at temperatures well below 40° F.

The accompanying illustration shows a typical dehydration plant as supplied by Silica Gel, Ltd., for the removal of moisture from air, which may be necessary where certain industrial operations are in progress. This plant consists of three superimposed adsorbers and is guaranteed to remove the moisture in atmospheric air from nine grains to not more than one-half grain per cubic foot of treated air. The operation is continuous and simple. All the valves are connected by sprocket wheels and chains which can be manually or automatically controlled as desired, and when required to operate under maximum load and humidity conditions the valve change sequence takes place once each hour. To the left of the adsorbers is shown the small gas heater for the reactivation of the silica gel: the vertical cooler, of compact design, is to be seen on the extreme right. These units can be supplied to meet the most stringent specifications as to the required degree of dryness in treated air or gases at high or low pressures, and can be built to conform to the height and area of the space available for erection and operation.

A Unique Evaporator and Vacuum Stove

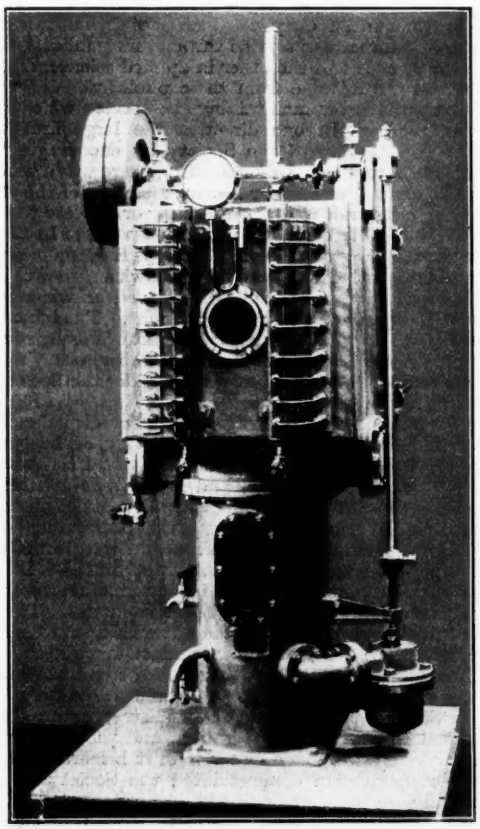
George Scott and Son (London), Ltd.

AT Stand No. A15, occupied by George Scott and Son (London), Ltd., the Scott patent forced-circulation evaporator under working conditions affords a unique opportunity for examining the minute details which are incorporated in the



STATIONARY VACUUM STOVE : FRONT VIEW GEORGE SCOTT AND SON (LONDON), LTD.).

chemical plant constructed by this firm. This evaporator, which is illustrated, is in pure nickel in-so-far as contact surfaces are concerned, and while, on a small scale, it is something more than a model in that the manufacturers intend to use it for testing out certain delicate products to which this type of evaporator lends itself particularly well.



STATIONARY VACUUM STOVE: BACK VIEW (GEORGE SCOTT AND SON (LONDON), LTD.).

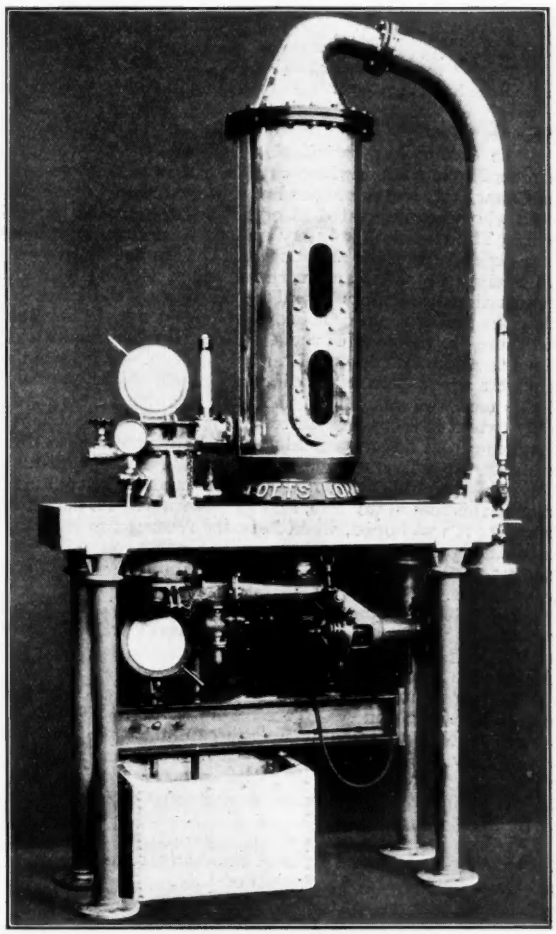
The calandria or tubular heating system of this evaporator is external to the pan. There is actually no obstruction whatever inside the pan itself, and it will be observed that the end covers of the calandria are hinged and may be swung clear for cleansing. The impellor is also hinged and may be swung away from the bottom of the pan for cleansing purposes. Other points which may be emphasised are its elasticity in the matter of holding capacity, and its freedom from entrainment, due to the calandria being external to the pan and the heated liquor delivered from the calandria entering the evaporator tangentially. The impellor, secured to the bottom of the vapour chamber causes the liquor in process to pass at an enormous velocity, through the heating tubes. The rise in temperature, in each circuit, is probably not more than 1 or 2° C., the evaporation being in the form of a flash-off as the liquor enters the pan.

The evaporator permits of batches of any desired volume being prepared within very elastic limits, consistent with the designed capacity of the plant. When dealing with liquids where high concentration is called for, the degree is little short of the limits of solidification, and in the case of high density caustic soda the design is certain to prove very attractive. A further outstanding feature is the facility afforded for rapidly cooling the product under vacuum while vigorous circulation is maintained.

The small stationary vacuum stove, also illustrated, is a model of compactness. It will be noted that this stove is fitted with shelves of various design—the coil type, the hot plate type and a heated plate to which the heating coil is secured underneath. The design is unique in so far as the condenser is concerned, for it should be noted that the condenser is formed directly below the drying chamber itself. The water vapour passes readily to this point, where it is condensed. A collecting chamber is formed immediately below the condenser fitted with sight glasses. From this chamber the distended vapour and water are withdrawn by means of the vacuum pump attached and delivered into a receiving chamber forming part of the same casting. The design lends itself to small scale units. It is particularly adapted for research departments, laboratory work and the handling of valuable pharmaceutical and chemical preparations in small scale operation.

Where it is useful to determine the volume of water eliminated during drying and the rate of evolution, graduated receivers are installed equipped with sight glasses for observation of the rate of evaporation. In cases where it is desired to recover a volatile solvent and where this stationary dryer is determined as most suitable, the collecting and measuring devices referred to are invaluable.

Where low temperature drying of delicate materials, foodstuffs, medicinal preparations, colours, etc., is essential, and



FORCED-CIRCULATION EVAPORATOR: OPEN FOR CLEANSING (GEORGE SCOTT AND SON (LONDON), LTD.).

where a temperature limit must not be exceeded at any stage of the process, this vacuum stove is as near the ideal equipment as is at present available. The heating elements are arranged for the use of steam, hot water, etc., and, if necessary, with thermostatic control.

D

Annual Meeting of the Society

Finance and Membership Problems

SIR HARRY MCGOWAN presided over the annual general meeting on Tuesday morning, when there was a large attendance.

Report of the Council

The Council, in their annual report, stated that the number of members on the register at July 14, 1931, was 4,540, compared with 4,596 at July 15, 1930. While regretting the inability to record an increase on the previous year's figures, the Council were not entirely dissatisfied with the position having regard to the depression in industry which affects so many of the members. The number who had resigned as a measure of economy was unusually heavy this year, and alone accounted for the difference in the membership figures. Since the last annual meeting 237 members had been elected; five members had been restored, and losses through death, resignation, etc., had been 298.

The following table showed the gains and losses in membership during the past five years:—

	1926—27	1927—28	1928—29	1929—30	1930—31
Membership at beginning of year	4,802	4,709	4,648	4,550	4,596
Gains	254	314	232	238	240
Losses	347	375	330	192	298
Net gain or loss	−93	−61	−98	+46	−56
Membership at end of year	4,709	4,648	4,550	4,596	4,540

While expressing satisfaction in the extent to which membership was holding its own in face of universal depression, the Council were not convinced that it even nearly represented those who were interested in or benefited from the Society's work. The chemical industry and profession became yearly more dependent on the abstracts and the annual reports which the Society prepared and without which various individual organisations and units would be faced with the costly and laborious preparation of their own requirements. The extent, and therefore the cost, of the abstracts was growing at a rate which the Council viewed with apprehension. If the membership were adequately reinforced, the Council would be relieved of this embarrassment, and the work could progress to that wider extent it was prepared to accept as its duty.

Income from advertisements was notably reduced, a direct result of the universal depression in industry. Appreciable economies in publication had been effected which tended to balance this loss in revenue, and as these were of a permanent character it was hoped, when industry returned to its normal state and permitted a corresponding effect on advertising revenue, that the benefit may be exhibited in extended publications.

The surplus of income over expenditure of £394 19s. 3d. was regarded as very satisfactory, though it was partly accounted for by the recovery of income tax payments deducted from investments revenue.

A further accumulation of interest in the Messel Fund had been invested to increase the capital of the Fund. The Council's policy of building up the capital of the Fund was dictated by the desire to secure an investment capable of yielding an income sufficient to balance the requirements of the future inevitable demands for increased publications and abstracts.

The Society in general meeting accepted the invitation of the Nottingham Section to hold the Annual Meeting of 1932 in Nottingham during the month of July.

The President moved the adoption of the report.

Dr. Levinstein's Review of Affairs

Dr. Levinstein, in seconding, referred to the general work of the Council during the past session, and mentioned the special efforts which had been made to celebrate the jubilee of the Society in a fitting manner. He also mentioned the increasing cost of publications, but expressed satisfaction that on the whole the Society had maintained its position and membership had remained more or less stationary. It was, however, of very great consequence to the chemical industry of this country that the membership of the Society should be maintained. In the past and at the present time the Society was being largely helped by important industrial concerns in various ways, and particularly in the matter of advertising in the Society's publications, which was not in many cases a business proposition for those firms.

Like the Chemical Society, the Society of Chemical Industry was rendering important service through its publications, the one in pure science and the other in applied science, and they depended on the revenue from these publications as well as upon subscriptions for maintaining the service which it was sought to render. In one direction the large firms could assist the membership of the Society by encouraging their young chemists to join. Unfortuntaely, there was a tendency for young chemists, when they became members of the staff of a large firm, either not to join the Society or to cease to belong to it. On the other hand, the membership of the Institute of Chemistry was going up quite in a straight line, and conversations were taking place with the Institute with a view to seeing if some closer co-operation could be arrived at which would reduce the cost of the Society's publications. The importance of the work was very great, yet the amount of money involved was small. A thousand or two more members or a £1,000 to £2,000 more income per annum would render the Society free from anxiety.

The accounts for the past year showed a credit balance, and he was, therefore, not making any apology or begging for money. At the same time, the Society was faced with the increased cost of publications, and it must be attended to. The chemical literature of foreign countries must be abstracted into an English journal, otherwise the importance of the Society's publications was diminished and the people would buy the publications of other countries and see in those publications the advertisements of plant manufacturers and chemical manufacturers of those other countries. Therefore it was of first importance that the advertising matter of the Society, as well as the original technical matter, should be carried to all parts of the Empire. An invaluable service was being rendered to chemists and chemical industry by the Chemical Society, the Institute of Chemistry, and the Society of Chemical Industry in co-operation, and the desire was to see that co-operation made closer than it hitherto had been. Finally, Dr. Levinstein congratulated the Society on being definitely classed by the income tax authorites as a charitable institution doing educational work, because this had been helpful in assisting the finances of the Society, inasmuch as their dividends on investments were not now taxed.

The report was unanimously adopted.

Treasurer's Statement

Dr. R. T. Colgate (treasurer) presented the accounts for the past year. He said the balance on the credit side of £395, as compared with £342 in the previous year, was more than it had been dared to hope for at the beginning of the year. The position had been helped by the decision in the income tax appeal, and he felt it his duty to say that unless the industrial conditions improved and the income increased there would be great difficulty in showing a credit balance next year and probably in one or two succeeding years. The total income last year was less by £422, but that had been more than counterbalanced by reductions in expenditure without in any way impairing the efficiency of the service rendered to the members.

New Officers

The President announced that the Council had selected Professor G. T. Morgan, F.R.S., as President for the coming year, and paid a high tribute to his work. The announcement was received with applause.

The election of the following four Vice-Presidents was announced: Mr. F. J. Hambley (President of the Council of the Society in Canada); Sir Harry McGowan; Dr. R. H. Pickard (retiring chairman of the Yorkshire Section); and Mr. J. A. Reavell (Past President, Institution of Chemical Engineers).

The following were elected to the Council as the result of the ballot: Professor J. W. Hinchley; Mr. C. S. Garland; Dr. W. Rintoul; and Mr. C. J. T. Cronshaw.

Messrs. Price, Waterhouse and Co. were re-elected auditors.

John Gray Jubilee Scholarship

The President announced that Mr. John Gray, a past president, had written offering to the Society a sum of £1,500 with certain simple conditions attached, as a gift specially to commemorate the jubilee, the income on which, Mr. Gray asked, should be used for founding a John Gray Jubilee Scholarship. It was asked that the first award should be made immediately, and that preference should be given to sons of members of at least ten years' standing. The offer had been accepted with gratitude by the Council and on behalf of the Society as a whole he expressed sincere thanks to Mr. John Gray for his generosity.

Dr. W. Cullen proposed a vote of thanks to the officers, members of Council, etc., for the work they had done during the past year. This was seconded by Mr. George Gray, and carried.

Congratulatory Messages

Following the annual general meeting, a luncheon was held at the Great Central Hotel, on the invitation of the Chairman (Professor G. T. Morgan) and the Committee of the London Section.

Professor C. G. Henderson (President of the Chemical Society), proposing "The London Section," conveyed the congratulations of the Chemical Society to the Society of Chemical Industry on its completion of fifty years' invaluable service, and he coupled with those congratulations hearty good wishes for continued and increasing prosperity. Professor Henderson said he was also acting on behalf of the Institute of Chemistry, the President of which was unfortunately unable to be present, and he presented an address of congratulation on behalf of the Institute.

Professor G. T. Morgan responded to the toast, and expressed his very warm thanks for the cordial terms in which it had been proposed.

The Presidential Address

By Sir Harry McGowan

In his presidential speech, Sir Harry McGowan pointed out that the progress made during the fifty years' existence of the Society of Chemical Industry could be gathered by the fact that the British Isles maintained in 1931 a greater population in a higher standard of comfort than in 1881. In that period the population had grown from 35 to 49 millions; the national income, from about £1,800,000,000 to £3,600,000,000. Actually the Chemical Industry could record a much more astonishing growth. Whereas the overall increase in British exports was only 53 per cent., the increase in our chemical exports during the fifty years was no less than 94 per cent.

Chemist and Industrialist

Sir Harry defined the task of the Chemical Industry as to bring to man's service an ever-widening knowledge of the use of different materials. But though his discoveries might appear to the chemist to be a final achievement, they were only the beginning of a new problem to the industrialist. It was the task of the industrialist to hold the balance between the application of new discoveries and the preservation of the existing economic equilibrium. New knowledge might threaten to derange whole industries, raising social, financial and political problems. In the case of artificial silk, for example, the existing textile industries found a new supply in their midst insisting by the merit of its attractions upon a share of public demand. Cotton and wool had to take note of a new arrival. The stone which the chemist threw into the waters caused still wider ripples to interfere with the existing economic position. He had, for example, succeeded in furnishing the plants of the field with sustenance which, previously, they drew through nature's slower channels. The result was the fertiliser industry, and now where once man feared scarcity he stood stifled by plenty. The balance between industrial and agricultural production had been dislocated. The scientist might congratulate himself upon having made two canes of sugar grow where before there had been one, but the industrialist might see his financial structure tumbling about his ears.

Disturbance of Economic System

Our economic system was clothed in a fabric of money in which disturbances of this nature tore great rents. Every improvement in processes which added to mastery over nature tended to lead to increased supply. Yet so long as monetary conditions remained unchanged, price movements were inevitable, and though the price of raw materials or manufactured goods fell, the capital of a company was subject to no such alteration. A pound issued in the form of capital ten years ago was still a pound to-day. A reduced volume of profits arising from a fall in prices, therefore, involved a reduction in the ratio of these profits to the fixed capital shown in the Balance Sheet which often led to a criticism of the industrialist which was entirely unjustified. The vast number of workers in industry were slow to realise that their products were bringing in less money and therefore slow to grasp that unless all costs fell proportionately with prices business would be lost and employment reduced. Other difficulties arose from the custom of borrowing capital at fixed rates of interest. Out of smaller profits, fixed interest rates took the same amount of money. Dividends were reduced, market values of shares declined, and the investor's purse was closed to new enterprises. The same difficulty in national finance, when a large proportion of the public expenditure was represented by unchanged rate of interest upon a National Debt, tended to increase the burden of taxation upon industry.

International Trade

Turning to international trade, Sir Harry observed that the rapidity of the advance in knowledge and in its application to mass production had been so great that to-day there was no great difference between the efficiency of different nations. When this like efficiency was accompanied by different standards of life, the competitive position of two nationalities with different scales of life took on a new meaning. The British industrialist therefore found that markets were being lost to him, either because of high tariffs or because of the adoption of the latest methods of production based on lower standards of living. What was the industrialist doing? He had endeavoured to search for additional financial strength and this had led to the development of larger and larger units in which the chemical industry in this country, as in Germany, the U.S.A., and elsewhere, has been a leader. Still, the industrialist was faced with many difficulties for the relief of which Sir Harry looked to three remedies; first, the adoption of a tariff in Great Britain, secondly, the promotion of an Empire economic unit, and thirdly, the still greater unification of various industries in each country, with wider measures of industrial planning.

The Tariff Problem

So far as tariffs were concerned, Sir Harry McGowan viewed them solely from the economic point of view and stressed the necessity of careful and scientific investigation before making sudden and drastic changes in any fiscal system. The same care was necessary in formulating any scheme for greater unification of Empire trade. The movement towards wider economic units was making slow but steady progress. Great Britain had to decide whether or not she would be a unit of economic Europe, or a unit in the great Commonwealth of nations of the British Empire. Sir Harry pressed the Statesmen of the Empire at their next Conference to formulate a long distance plan for the economic development of their countries. How long—he asked—is it to be before the Empire matched Europe's example and systematically studied, thought and planned. He pleaded also for a General Staff for British Industry, in which industrial, labour, financial, economic and marketing experts would survey the national position, mobilise our strength and substitute co-ordinated action for spasmodic effort.

Lessons from the British Dyestuffs Industry

By Dr. Herbert Levinstein

In acknowledging the presentation to him of the Society of Chemical Industry's Medal for distinguished services to science, especially to the British dyestuffs industry, at the Royal Academy of Music, London, on Wednesday morning, July 15, Dr. Herbert Levinstein, of Manchester, delivered a notable address on the lessons the history of the British dyestuffs industry offers to other national industries. He emphasised especially the danger of preferring foreign to British-made products and the national importance of a "Buy British" policy, and concluded with a warning to Lancashire to reconsider its "Buy in the cheapest market" maxim.

British and German Chemical Combines

DR. LEVINSTEIN said that in a few years chemists in this country might find it difficult to understand the great economic, political and technical importance to the nation of the dyestuffs industry with its small turnover before and during the war and during the peace negotiations. In Germany it might be different, because the great German chemical combine, the I.G. Farbenindustrie, was essentially a combination of dyestuff manufacturers, while the great British chemical combine, Imperial Chemical Industries, was mainly a combine of heavy chemical and explosives manufacturers. In both countries the industry of making dyes was now only part of a much bigger business, but the difference in origin might account for a different business outlook in the two combines. In the German chemical industry the dyestuff group always predominated, not the alkali or acid group as in England. The two great combines in Germany and England had a different history and tradition, the chemical industries of the one being based on the dyestuff industry, those of the other on the heavy chemical industry. The latter depended for success on making comparatively few products extremely well and selling them at prices usually fixed by international agreement. The former relied on making a large variety of substances constantly changing in range as new products appeared in the laboratory and were taken up for large scale manufacture because they seemed to have a profit-making capacity. Success in the latter field involved not only good chemists but most efficient salesmanship and great skill in the selection, from the great mass of research results, of the right products for manufacture.

When he himself in 1900 went to Blackley, where his father began making dyes in 1864, the German industry was already very strong, but it would surprise some to hear that before his arrival over thirty years ago the intermediates used at Blackley in making dyes were mostly made there. It was often thought that the dyes made in England in 1914 were mostly made from German intermediates but the greater part of the Blackley works as he first knew them was occupied by plant to make intermediates which were actually sold to German firms to make their own dyes. It was the loss of those German orders that chiefly led to the closing down of their intermediates department.

Users' Preference for Foreign Goods

Discussing the British makers' handicap owing to the popular preference at that time for German products, Dr. Levinstein mentioned that when the Calico Printers' Association was formed the buyers for that combine succeeded by a process of squeezing prices between the German producers and his father's firm, then the only English maker of certain products, in placing their contract for one year at 4¼d. per lb. They believed wholeheartedly in the Manchester maxim of buying in the cheapest and selling in the dearest market. The result was that his father gave up the manufacture in disgust. A ring was then formed in Germany and the following year the Calico Printers' Association offered his father their contract at a much higher price than they had refused a year before. Thus to buy in the cheapest market was not always quite so easy or profitable as appeared on the surface.

German Penetration

Describing other obstacles against the British maker in the early days Dr. Levinstein said that his father took an active part in agitating for and ultimately securing a reform of our Patent Laws. One of the main objectives was to secure the compulsory working in this country of all British patents held by foreigners, provided those patents were being worked in the country of origin. The Patent Act of 1907, afterwards unfortunately emasculated by a decision of Lord Justice Parker, made several of the German dyestuff companies erect plants at Bromborough and Ellesmere Port respectively, and the companies in question ceased to purchase intermediates at Blackley. The cordial personal relations between his father and Von Bottinger and Heinrich Caro ceased. Wherever Blackley dyes were sold they were undercut and subtle hostile propaganda made itself felt in unexpected quarters.

This was part of a wider German policy. It was a phase in the economic war, later on interrupted by the battles in which for four and a half years the flower of our youth perished and which caused equal destruction in Germany. Whither this economic war, imposed on people by the existing organisation of society, was now leading no man could foretell; its general direction was not difficult to perceive in the years immediately preceding 1914.

What "Buy British" Means

The greatest difficulty of British dyestuff makers, as Professor Green pointed out in 1901 in an address to the British Association, was the reluctance of customers to change from foreign to British products. It would have made all the difference if the British consumer had realised that it was to his disadvantage to place himself entirely in the hands of the German industry. If he had merely resolved to give the preference to British dyestuffs at equal prices and qualities, that would have given the English makers all they expected and asked. The strong hold of the German sales organisation prevented this and he could honestly say after many years' experience that he had never seen any marked inclination on the part of British consumers to give preference to a British-made product. A preference at equal prices in the English market would have been sufficient, together with the foreign sales, to employ the works to the full—a vital factor in costs—to carry a much larger range of products, and to permit great expansion in many directions.

Illustrating how this bias in favour of German dyes worked, Dr. Levinstein said that in 1914, when they were the largest actual manufacturers of dyes in this country, Blackley was making over 150 chemically distinct dyestuffs, yet some quite important consumers would not even test samples or look at pattern cards of British products. A new product had indeed a great advantage if sold by one of the big German companies. In 1896, for example, they patented quite a nice colour called Dianol Brilliant Red Extra. By 1914 the sales were practically nil, yet under the name of Acetopurpurine 8B this very dyestuff figured in the short Birchenough list, drawn up during the war, as an indispensable dye, one demanded by the dyers and printers as essential to the trade of the country. "Thus," said Dr. Levinstein, "a dye we could not sell in England during the fourteen years immediately before 1910, the period in which it was our monopoly, found a sufficient market during the next four years, after the patent had expired, to become listed as an indispensable dye!" This showed the advantage given to dyestuff manufacturers in this country by the Dyestuffs Act. They knew exactly what was being imported.

How German Competition was Helped

If, Dr. Levinstein continued, emphasising the importance of production costs, before the war in Free Trade England a miracle had happened and a duty of less than 2d. per lb. (1½d. would have been the ideal figure) had been imposed on foreign dyes, this small sum would have enabled the English makers and not Germans to have the pull in costs. English dyes would have been 1½d. cheaper to make because of the increased production, German dyes 1½d. dearer because of the duty. What a wonderful investment that would have been for this country!

Remarking that the influence of the German companies and of those representing them was very strong even in unexpected

quarters, Dr. Levinstein mentioned that in the early days of August, 1914, he went to Woolwich, where some large orders were being placed for webbing for the Mills equipment at the request of one of the manufacturers of this material. Before the war the webbing was always dyed with Katigen dyes of the Bayer Co. He doubted whether at that time the fact that the brands specified for this equipment were German and that this could render supplies according to specification unavailable, had reached official notice. It was galling to find that for years these foreign dyes, in no way better or cheaper than their own corresponding products, had previously been exclusively specified and used in dyeing the mills equipment webbing for our troops. Their own Thionol dyes satisfied every test for fastness applied before the war to the favoured Katigen dyes. Supplies of these were at once made available to the manufacturers who were thus able to fill their order for webbing without any delay through dyestuff shortage. "This," said Dr. Levinstein "is an example of German peaceful penetration and a good instance of the value of the preference on equal terms which the Germans frequently enjoyed."

Value of National Prestige

Emphasising the importance of national prestige in trade, Dr. Levinstein said that between 1864 and 1871 the Germans fought three short and successful wars, and their conclusion was marked by an enormous development in German industry. In 1872 and after, the sales of German dyes went up by leaps and bounds. Their travellers were able, active, and unfettered by patent restrictions. Equipped with dyes mostly discovered in England they travelled abroad to the Eastern markets where they soon established their brands, creating a demand for German dyes by insistent salesmanship. Alizarine Red, for example, was patented in England both by Perkin and by a German firm in 1869, but by 1875 the German sales were 2½ times those of Perkin.

How Germany was Favoured

The Germans could manufacture more cheaply in consequence of their bigger sales. They were also free from the restrictions imposed by our Government on the use of industrial alcohol, which was in consequence of those restrictions much dearer in England. Most of the earlier dyes required alcohol for their production and the cost of this was a most important part of the cost of the dyes. Such dyes were therefore much cheaper to make in Germany. For many years no dye requiring alcohol could be economically produced in Great Britain.

Lastly, there was no patent protection in Germany for English dyes for a number of years after the Franco-Prussian war, while in England we granted patent protection to German dyes. Need he remind them how much effort was required to persuade the Government to relax their regulations on the use of spirit or to amend their one-sided patent law? A generation elapsed before any success was obtained. In the meantime the Germans greatly developed their business.

Lessons for To-Day: A Message for Lancashire

The history of the dyestuffs industry had vital lessons for other national industries. "For instance," Dr. Levinstein concluded, "the Lancashire cotton trade has lost a considerable portion of its foreign trade, chiefly because the cost of production in Lancashire is considerably higher than in Japan. Do you remember what was happening in the dyestuff industry in the earlier seventies? German dyes were considered cheap and nasty substitues for the British products. Their sale was actively pushed in the Far East. With a large production, with the trade concentrated in a few self-contained units, the Japanese are well able to compete for the highest class of trade once they have captured the mass production articles, and then to produce novelties of their own. It is sad to see the patience with which many thousands of Lancashire folk are waiting for the return of good times which under present conditions can never recur. The history of the dyestuff industry has not always been rightly interpreted, yet it has a lesson of universal application. Where it costs least to manufacture, thither other things being equal, orders will flow; and enterprise and capital will follow on the tide. Most industrial inventions are made or developed when sales are greatest and profits best, for science is but the servant, not the master, of industry.

Improvements in Acid-Resisting Iron

Haughton's Patent Metallic Packing Co., Ltd.

DURING recent years, much attention has been devoted to the improvement of Ironac high silicon iron alloy, which is exhibited at the British Chemical Plant Exhibition by Haughton's Patent Metallic Packing Co., Ltd., of 30, St. Mary-at-Hill, London, E.C.3 (Stand No. B.32).

Ironac ferro-silicon is an alloy which possesses an extremely wide range of resistance under corrosive conditions. It possesses the ability of resisting hot concentrated sulphuric acid, copper sulphate solutions, hot or cold nitric acid, and whilst not usually considered suitable for hot concentrated hydrochloric acid, it will withstand the hot dilute acid to a very satisfactory degree. The strength of high silicon irons, considered generally, varies in proportion to its silicon content. An excess in silicon content reduces its mechanical strength, becoming stronger as the silicon content is reduced, whilst, on the other hand, the corrosion resisting properties become higher with a slight increase of silicon, until an excess of 15 per cent. is reached, when the mechanical strength of the alloy shows weakness and there is a distinct decrease in its corrosion resisting qualities.

A feature which has received very much attention these last few years, is the heat treatment of Ironac alloy. By means of careful annealing extended over prolonged periods, a much greater mechanical strength is obtained than was formerly experienced. The standard Ironac alloy now shows a transverse strength of about 1,500 lb. per square inch. With hot sulphuric acid or nitric acid, shows a penetration after twelve months' working of only 0·001 inch. With the improvements in heat treatment and annealing, the metal is also found to withstand varying temperature changes much better than formerly, and where solutions have to be handled, which necessarily vary in temperature to a considerable degree, pipe lines in Ironac, and also pumps and valves of this material, have proved very effective.

Ironac acid-resisting iron still stands pre-eminent as the material for construction of nitric acid plant, and in connection with condensation of nitric vapours in ammonia oxidation plant. For this reason it is very widely used in the artificial fertiliser industry and in explosives works. The usual methods of dealing with this material, as far as machining is concerned, is by grinding with carborundum wheels, although a limited amount of machining, such as turning operations, can be performed with special tools adapted to hard alloys.

High Duty Iron

A New British Chemical Standard

WE are informed that a new high duty iron is now about to be issued as a British chemical standard. Its analysis is :—

	Per cent.
Total carbon	2·68–
Graphite	1·82–
Combined carbon	0·86–
Silicon	1·30–
Manganese	0·410
Sulphur	0·125
Phosphorus	0·45–

This sample has been made specially to meet the need for an iron low in total carbon, moderately low in phosphorus, and fairly high in sulphur content. Great care has been taken to prepare fine turnings free from dust to make it as homogeneous as possible, and particularly with a view to its use for the determination of total carbon and graphite. It is of interest to note that in order to prevent deterioration the bulk of the turnings are being stored in an atmosphere of dry nitrogen. By using British Chemical Standard irons "A," "B," "D2," and "G" either separately or in conjunction, it is now possible to have standards which cover all the usual requirements of ordinary cast iron. In accordance with the usual practice iron "G" has been standardised by a number of chemists representing manufacturers of refined iron, makers of high duty castings, and independent analysts.

Unusually full notes on the methods of analysis used are given on the certificate of analyses issued with each bottle. Further particulars may be obtained from British Chemical Standard Headquarters, 3, Wilson Street, Middlesbrough.

British Overseas Chemical Trade in June

A Slight Set-back for Exports

THE Board of Trade returns for British overseas trade during June, 1931, show exports of chemicals, drugs, dyes and colours at a total of £1,282,048, which is £301,720 lower than in June, 1930; imports at £925,374 are lower by £89,751; and re-exports at £46,658 are lower by £7,805.

The statistics for exports and imports during each of the past six months are set out below, showing percentage fall or rise calculated on figures for the corresponding months of last year. Here it will be seen that there is a slight set-back for exports, but imports continue to improve.

	Jan.	Feb.	Mar.	Apr.	May	June
Exports ..	− 36·5	− 40·5	− 30·5	− 19·4	− 15·4	− 19·0
Imports ..	− 22·7	− 11·3	− 13·2	+ 4·8	− 16·4	− 8·8

For the first six months of the present year exports have dropped £2,897,146, and imports have dropped £817,764, in comparison with the corresponding period of 1930.

Imports

	Quantities Month ended June 30.		Value Month ended June 30.	
CHEMICAL MANUFACTURES AND PRODUCTS—	1930.	1931.	1930. £	1931. £
Acetic Anhydride ..cwt.	94	295	411	860
Acid, Acetic .....tons	515	842	19,725	31,177
Acid, Tartaric ....cwt.	3,416	3,929	21,438	17,915
Bleaching materials ,,	7,292	5,546	6,018	7,585
Borax..... ,,	12,950	30,075	7,919	17,328
Calcium carbide .. ,,	51,600	46,159	32,592	28,117
Coal Tar Products, not elsewhere specified value	—	—	69,304	3,913
Glycerine, Crude ..cwt.	1,742	1,072	3,142	1,385
Glycerine, Distilled ,,	1,037	2,374	2,413	4,495
Red Lead and Orange Lead .....cwt.	7,727	3,511	11,078	4,448
Nickel Oxide..... ,,	12	100	63	397
Potassium Nitrate ,,	3,916	9,060	3,704	7,963
Other Potassium Compounds .....cwt.	52,569	78,020	31,866	33,442
Sodium Nitrate ... ,,	18,531	48,634	8,934	21,677
Other Sodium Compounds .....cwt.	31,800	42,106	22,500	24,142
Tartar, Cream of .. ,,	2,480	2,784	11,302	10,981
Zinc Oxide.....tons	1,045	572	29,023	12,750
All Other Sorts ..value	—	—	242,574	236,493
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	15,850	65,849	1,320	5,075
Bark Cinchona (Bark Peruvian, etc.) ..cwt.	2,787	1,672	12,794	6,264
All Other Sorts ..value	—	—	102,744	135,751
DYES AND DYESTUFFS—				
Intermediate Coal Tar Products .....cwt.	82	53	958	618
Alizarine ..... ,,	11	4	397	214
Indigo, Synthetic.. ,,	—	—	—	—
Other Sorts ..... ,,	3,250	3,012	85,314	64,655
EXTRACTS FOR DYEING—				
Cutch .....cwt.	3,894	4,325	7,346	6,997
All Other Sorts.... ,,	2,409	2,130	9,667	7,282
Indigo, Natural ... ,,	27	—	790	—
Extracts for Tanning (Solid or Liquid) cwt.	92,913	89,030	96,533	77,020
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground ..cwt.	54,501	47,648	10,918	9,468
White Lead (dry).. ,,	13,498	12,174	22,134	16,577
All Other Sorts.... ,,	169,121	115,071	140,144	130,385
Total of Chemicals, Drugs, Dyes, and Colours .....value	—	—	1,015,125	925,374

Exports

CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Sulphuric....cwt.	24,337	1,341	4,793	1,587
Acid, Tartaric..... ,,	1,149	609	7,476	3,005
Ammonium Chloride (Muriate) .....tons	196	224	3,773	4,012
Ammonium Sulphate—				
To Spain and Canaries tons	16,403	4,962	129,486	34,655
,, Italy..... ,,	70	71	665	385
,, Dutch East Indies tons	1,210	291	10,135	2,179
,, China (including Hong Kong) tons	10,069	3,977	84,369	29,438
,, Japan..... ,,	2,199	502	19,216	3,765
,, British West India Islands and British Guiana..tons	830	1,232	6,630	8,658
,, Other Countries ,,	5,210	3,952	41,126	27,782
Total ..... ,,	35,991	14,987	291,627	106,862
Bleaching Powder (Chloride of Lime)....cwt.	37,827	39,657	11,192	11,436
COAL TAR PRODUCTS, not elsewhere specified—				
Anthracene .....cwt.	—	—	—	—
Benzol and Toluol galls.	5,221	2,102	602	181
Carbolic Acid (Crude) ..	2,368 Cwt.	7,451 Galls.	3,554	548
Carbolic Acid (Crystals)	686 Galls.	2,839 Cwt.	2,392	6,842
Cresylic Acid.....	79,947	59,600	8,800	6,220
Naphtha .....galls.	3,011	2,532	327	268
Naphthalene (excluding Naphthalene Oil) cwt.	11,276	5,941	2,923	1,527
Tar Oil, Creosote Oil, etc. galls.	2,056,396	2,786,842	49,234	62,396
Other Sorts .....cwt.	17,465	24,776	8,562	10,024
Total.....value	—	—	76,394	88,006
Copper, Sulphate of..tons	3,127	4,637	67,825	83,522
Disinfectants, Insecticides, etc. .....cwt.	24,313	33,143	54,677	71,449
Glycerine, Crude .... ,,	1,465	1,866	1,848	2,412
Glycerine, Distilled .. ,,	48	7,576	219	18,134
Total ..... ,,	1,513	9,442	2,067	20,546
POTASSIUM COMPOUNDS—				
Chromate and Bichromate .....cwt.	1,232	1,029	2,400	2,118
Nitrate (Saltpetre) ,,	671	1,068	1,246	1,861
All Other Compounds cwt.	7,077	463	11,674	6,997
Total ..... ,,	8,980	2,560	15,320	10,976
SODIUM COMPOUNDS—				
Carbonate, including Soda Crystals, Soda Ash and Bi-carbonate cwt.	268,652	288,408	74,670	76,001
Caustic..... ,,	112,016	98,064	77,092	67,596
Chromate and Bi-chromate .....cwt.	1,683	1,563	2,927	2,671
Sulphate, including Salt Cake .....cwt.	77,693	13,531	9,793	2,300
All Other Compounds cwt.	38,419	41,823	51,838	49,599
Total ..... ,,	498,463	443,389	216,320	198,167
Zinc Oxide.....tons	180	261	5,159	5,564
Chemical Manufactures All Other Sorts..value	—	—	272,528	185,761
Total of Chemical Manufactures and Products ..value	—	—	1,029,151	790,893
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	107,566	94,927	11,707	10,008
All Other Sorts ..value	—	—	205,260	185,933
Total..... ,,	—	—	216,967	195,941
DYES AND DYESTUFFS—				
Products of Coal Tar cwt.	9,061	9,518	73,451	83,062
Other Sorts ..... ,,	6,649	4,615	6,076	5,388
Total ..... ,,	15,710	14,133	79,527	88,450

	Quantities Month ended June 30. 1930.	1931.	Value Month ended June 30. 1930. £	1931. £
PAINTERS' COLOURS AND MATERIALS—				
Barytes, Ground ..cwt.	1,400	2,741	784	1,109
White Lead (dry).. ,,	2,188	2,253	4,450	3,884
Paints and Colours in Paste Form ....cwt.	25,954	20,180	47,859	36,849
Paints and Enamels Prepared (including Ready Mixed) .....cwt.	40,145	34,546	130,159	104,757
All Other Sorts.... ,,	46,540	35,441	74,871	60,165
Total ..... ,,	116,227	95,161	258,123	206,764
Total of Chemicals, Drugs, Dyes and Colours ...value	—	—	1,583,768	1,282,048
Re-exports				
CHEMICAL MANUFACTURES AND PRODUCTS—				
Acid, Tartaric ....cwt.	69	68	502	401
Borax..... ,,	622	244	349	170
Coal Tar Products, not elsewhere specified value	—	—	11	7
Potassium Nitrate (Saltpetre) cwt.	54	45	76	58
Sodium Nitrate ... ,,	719	1,281	361	627
Tartar, Cream of .. ,,	273	566	1,429	2,387
All Other Sorts ..value	—	—	16,657	9,372
DRUGS, MEDICINES, ETC.—				
Quinine and Quinine Salts .....oz.	5,554	7,546	530	754
Bark Cinchona (Bark Peruvian, etc.) ..cwt.	141	315	803	3,843
All Other Sorts ..value	—	—	26,698	23,503
DYES AND DYESTUFFS—				
Extracts for Dyeing— Cutch .....cwt.	1,568	715	2,407	1,093
All Other Sorts.. ,,	139	45	1,194	266
Indigo, Natural ... ,,	5	12	102	403
Extracts for Tanning ,,	615	1,215	645	1,405
PAINTERS' COLOURS AND MATERIALS.....cwt.	746	1,118	2,210	2,051
Total of Chemicals, Drugs, Dyes and Colours ...value	—	—	54,459	48,654

An Advance in Treatment of Solid Fuel

The Clean Coal Co., Ltd.

THE advances which are being made in the reorganisation of the coal industry are well illustrated on Stand No. B.18A by the Clean Coal Co., Ltd., of Medway House, Horseferry Road, London, S.W.1. The exhibits are intended to show the remarkable differences between the raw coal and the products obtained from the company's de-dusting and gravity separation process. They are arranged to demonstrate the fact that "clean coal" containing no more than its inherent ash, usually ranging from 1 to 3 per cent., can be produced commercially in yields closely agreeing with those obtained in laboratory testing. The differences in properties between the natural dust, which in this process is recovered in a state ready for direct coal dust firing, the clean coal and the refuse are clearly demonstrated, and the change in appearance from the untreated coal to clean coal is most remarkable. The economic aspect of the problem becomes manifest from an inspection of the various specimens of ashes which are shown in relation to the products from which they are derived.

Other exhibits of the Clean Coal Co. are concerned with its briquetting process in which tar is used in the place of pitch, the pitch being formed by the extraction of the tar oils from the briquetting mixture. Photographs are shown of various plants erected by the Clean Coal Company or in course of erection for Amalgamated Anthracite Collieries, Ltd.; Newton, Chambers and Co., Ltd.; Samuel Fox and Co., Ltd. (United Steel Companies); the Tinsley Park Colliery Co., Ltd., and other colliery companies.

These installations comprise some of the most up-to-date examples of British chemical plant manufacture, and it is gratifying to note that in this particular line Great Britain is ahead of other countries.

A Range of Small-Scale Plant

A. Gallenkamp and Co., Ltd.

SMALL scale chemical plant comprising Soxhlet extractor, vacuum drying oven, grinding mill, disintegrator, mixing machine, shaking machine and filter press, has attracted considerable attention at Stand No. B.33, which comprises the exhibit of A. Gallenkamp and Co., Ltd., of Sun Street, Finsbury Square, London, E.C.2. The vacuum drying oven is of stout copper, tinned inside, and is hermetically closed by means of a ground-on brass door. The jacket is half filled with glycerine and water and heated by means of a bunsen burner, or steam may be used to obtain higher temperatures. It is claimed to dry, within three hours, preparations which generally require three days in a desiccator. The disintegrator is capable of dealing with quantities up to 1 cwt. and can be easily cleaned when changing from one material to another. Almost any dry material can be reduced to a fine powder, varying according to its nature from about one millimeter down to the finest flour. The front of the machine is removed in a few seconds, completely exposing the working part, thus allowing them to be brushed, wiped, or sponged when special cleanliness is necessary. The perforated steel sieves which regulate the fineness are interchangeable, and are fixed in a few seconds by thumb nuts on the underside of the machine, and the finished flour passes out through these to the receptacle below, which can take the form of a drawer or box, or a fixing can be placed under the mill to which a small bag of linen or suitable cloth can be clasped so that the ground material is delivered direct from the mill into the bag. The power required is 1-2 H.P.

Electrical laboratory furnaces of the tube and muffle types, graduated instruments and apparatus for the testing of petroleum, tar, asphalt and similar products are also shown in great variety.

A New Type of Leaf Filter

Manlove, Alliott and Co., Ltd.

THE most striking exhibit at Stand No. B.29, staged by Manlove, Alliott and Co., Ltd., is a short section of a rotary dryer complete with driving gear, which is fitted with a glass end plate to allow the action of the internal lifters to be observed, whilst the dryer is in motion. The Easifilt vertical pressure leaf filter for solvents, clarification and general filtration, to which considerable prominence is also given, was fully described and illustrated in THE CHEMICAL AGE, July 11, page 31. To these remarks it may be added that one form of this filter is specially adapted to handle cake which cannot be blown off the leaves by air pressure, such as cake which sticks too closely or cracks and allows the pressure to escape before it becomes effective. For such a duty a floating leaf battery type of filter is employed. This design is such that the battery may be drawn clear of the filter on rails, thus permitting the cake to be dumped directly into a cake truck, rendering every part of the filter leaves easily accessible to the operator. Other exhibits comprise a centrifugal mixing impellor, which provides an ample stirring and agitating action at comparatively low speed, a 42 inch bottom-discharge Weston centrifugal, and a 24 inch Johnstone vacuum dryer. The last-named plant can be economically employed for drying materials at low temperature such as oxides, hyposulphate of soda and blood; it is manufactured in sizes up to 8 ft. diameter.

Jointings for All Purposes

James Walker and Co., Ltd.

THE attractive stand No. A.19 occupied by James Walker and Co., Ltd., of Woking, is devoted entirely to packings and jointings for all purposes and pressures. The wide range of exhibits shown should satisfy the requirements of all chemical plant engineers. Practical experience and a detailed study of packings and jointings for all classes of power, enables this firm to give valuable advice in the construction of new work. Trouble with stuffing boxes and glands might easily be avoided when plant is being designed, and often overcome by alteration to existing plant. They have made this branch of their business a special feature and will be pleased to furnish suggestions and drawings free to those disposed to consult them.

Chemical and Metallurgical Corporation.

Kemet Gala Day

FEW firms have done more to foster and put into reality that modern slogan "Peace in Industry" than have the Chemical and Metallurgical Corporation, Ltd., since its establishment a few years ago at Astmoor Works, Runcorn. In the past two or three years a strong bond of fellowship has been created between employer and employee. Football, cricket and swimming teams were formed with the support of the management and these won their way into prominent positions in local sporting circles. A welfare scheme was also introduced by which employees could, by voluntary contributions, receive excellent benefits in case of sickness, accident, etc. To promote and foster the recreative welfare of their employees the Directors of the Company presented to them the gift of ten acres of land suitable for playing fields, situated in the grounds of the old Norton Priory and since that time when the gift was made—16 months ago—a transformation scene has taken place. Two excellent hard tennis courts have now been opened, a cricket pavilion and pitch are used by the employees and on Saturday last, July 11, a third stage was reached when a large general pavilion and bowling green were opened.

Future Well-being of the Company

The deplorable condition of industry is well known and the Kemet Works have, in common with others, been passing through lean times and as a result sacrifices have had to be made by the whole staff. However, under the capable guidance of Mr. F. Arnatt, the managing director, and by gradual re-organisation and hard work the firm have established themselves in a sound position and their gift of a new pavilion to the Recreation Club, together with their continual generous help to the employees' social organisations, is evidence of the confidence they have in the future well-being of the concern.

Mr. Arnatt, by his kindness and intuition, has earned the esteem of all the workpeople and on Saturday he proved himself a generous host by providing teas for over 700 people, including workers, their wives and children. The sun shone throughout the whole of the afternoon and everyone present had a most enjoyable time. The black and white pavilion, with its attractive French windows, was greatly admired by those present, and the large bowling green, excellently laid, was an inducement to all trundlers. On the cricket pitch a match between Kemet and Astmoor was in progress, a tournament was being decided on the tennis courts, and a level patch of greensward fenced off for children's sports.

The Opening of the New Pavilion

The opening ceremony at the new pavilion was performed by Mr. F. Arnatt, and Mr. J. Hayes (chairman of the Recreation Club) presided. Others present included Mrs. Arnatt, Miss Arnatt and Miss Marian Arnatt, Mr. and Mrs. W. Moors (Astmoor Tanning Co.), Mr. and Mrs. J. W. Crabtree, Mr. and Mrs. W. J. Maltman, Mr. and Mrs. D. W. Beesley, Mr. S. B. Casson, Dr. Bott, Mr. C. W. Ashton, Mr. R. P. Evans, Mr. T. Looker, Mr. Hoal, Mr. Van Rooyen and Mr. Leadbetter.

Mr. Hayes said that he was pleased to occupy that position and he was glad that so many had come along to support him. The history of their club dated back only 16 months and when they looked around and saw the work which had been accomplished they would agree that the committee and the members had made a great effort to make that Recreation Club the most enterprising in the district. He thought that they could divide their history into three chapters. The first opened when the Directors in March last year kindly placed at their disposal 10 acres of land in those beautiful grounds of Norton Priory. They then got busy in making the grounds into playing fields and appointed Mr. White their first secretary. They owed Mr. White a deep debt of gratitude for the service he had rendered. The second chapter opened with a visit from their chairman of the Board of Directors, Dr. Andreae, who in July of last year opened the tennis courts and during the past 12 months very much pleasure, and not a little physical fitness, had accrued from the use of those courts. They came to their third and important chapter that afternoon. Mr. Arnatt did not need any introduction. They had long since learnt to regard him as a friend. He was a very real friend to them at the Works and despite a very anxious time industrially he had found time to interest himself in their welfare both at the works and in their leisure hours. He had very much pleasure in calling upon him to perform the opening ceremony.

Mr. F. Arnatt, who was enthusiastically received, thanked the chairman for the kind remarks he had made with reference to him. It was always a pleasing thing, continued Mr. Arnatt, to try and help people who they knew would help them in return. That afternoon he had the pleasant task of opening the club's new pavilion, but before proceeding to that he wanted to say how delighted he was to see so large a gathering of the families and friends of members and of friends of the Company. To everyone he extended a hearty welcome. He also wanted to congratulate the committee who had organised that gala day. There could be no better proof of the success of their efforts than the splendid attendance they saw there, and the committee had every reason to be well pleased with the excellent result of their endeavours.

In the evening Mrs. F. Arnatt gracefully presented the prizes to the winners of the events in the various sports, a feature of which had been the handing in of no fewer than 273 entries for the children's races. Dancing in the pavilion brought a most pleasant day to its close.

Chemical Matters in Parliament

Beet-Sugar Factory Advances

IN the House of Commons on Friday, July 10, Sir H. Samuel asked the Financial Secretary to the Treasury whether any of the repayments of advances made to beet-sugar factory companies under the Trade Facilities Acts, 1921 to 1926, are in arrear, and, if so, to what amount; and what is the amount of those advances which has been written off as irrecoverable?

Mr. Pethick-Lawrence: Payment has been made by the Treasury of £541,980 in respect of principal and £3,266 in respect of interest on advances to beet-sugar factory companies guaranteed under the Trades Facilities Acts. Towards these payments £12,000 has so far been recovered, and of the remainder some £162,446 must be regarded as irrecoverable.

Scientific Establishments

On Monday, July 13, Mr. F. Riley asked the Secretary of State for War whether schemes for applying the report of the Treasury Committee on Scientific Establishments, presided over by Professor Sir Harold Carpenter, have been drawn up for any of the following Departments: Department of the War Department Chemist, Royal Ordnance Factories, Research Department, Woolwich, Air Defence Experimental Establishment, Signals Experimental Establishment, and Chemical Defence Research Department; and, if so, whether an assurance can be given that full opportunity will be given to the appropriate staff associations for discussion in accordance with normal Whitley procedure?

Mr. Shaw: Schemes are being actively prepared for applying the recommendations of this Committee to the establishments referred to, other than the Royal Ordnance Factories, to which it has been decided they are not appropriate. The answer to the second part of the question is in the affirmative.

Dyestuffs (Import Regulation) Act

On Tuesday, July 14, Mr. Denman asked the President of the Board of Trade whether he will appoint a committee to examine whether the undertakings given by manufacturers of dyestuffs, in faith of which the Dyestuffs Act was continued for one year, are being fulfilled?

The President of the Board of Trade (Mr. William Graham): My honourable friend presumably has in mind the principle which I informed the hon. Member for East Wolverhampton (Mr. Mander) on January 27 would in future be applied in considering applications for import licences. I am satisfied that the statutory Advisory Licensing Committee is giving full effect to that principle, and I see no occasion to appoint another committee.

Alliance Artificial Silk Affairs

IN the Chancery Division on Monday, Mr. Justice Maugham had again before him the petition of the Cellulose Acetate Silk Co., of Lancaster, for compulsory winding up of Alliance Artificial Silk.

The Cellulose Co. is a contingent creditor for upwards of £210,000 in respect of a contract for the supply of cellulose acetate.

His lordship allowed the matter to stand over for a further two weeks.

From Week to Week

THE OIL STORAGE DEPARTMENT of the Planet Oil Co., Planet Street, Cardiff, was gutted by fire last week.

THE GERMAN production of diamyl, dibutyl and diethyl esters of phthalic acid, employed principally as plasticisers, is estimated at approximately 200 tons per annum. The German dye trust holds patents for the production of phthalic anhydride from which the esters are obtained.

OWING to the great risk of explosion and fire existing in the event of the forced landing of aircraft within the Salt End Chemical Works, Hull, the Air Ministry have issued a notice to airmen to the effect that flights over these works at an altitude of less than 1,000 ft. should be avoided.

LEADING EXPERTS in safety in mines research from Great Britain, France, Belgium, Germany, and the United States agreed at Buxton recently to embark on a scheme of international co-operation. They will pool the results of their investigations, and hold an annual conference.

THE GOVERNORS OF THE NORTHERN POLYTECHNIC have appointed Dr. T. J. Drakeley as principal, in succession to Dr. R. S. Clay, who is retiring after 29 years' service. Dr. Drakeley has been head of the Chemistry Department and School of Rubber Technology at the Northern Polytechnic since 1919, and will enter upon his new duties on January 1, 1932.

TWO TONS OF MOLTEN METAL were hurled fifty yards when a converter exploded, on Wednesday last, July 15, at the works of the Wolsingham Steel Co., Durham. Six foundry workmen were burned, two severely, and a fifteen-year-old apprentice, John Pybourne, who received the full force of the explosion, was taken to the Newcastle Infirmary in a critical condition.

A COMMITTEE, under the chairmanship of Lord Gorell, has been appointed by the President of the Board of Trade to consider and report upon the desirability of forming in London a standing exhibition of articles of current manufacture, and of forming temporary exhibitions of the same kind. The desirability of organising local or travelling exhibitions of the same kind, both at home and abroad, will also be considered.

WORLD PRODUCERS OF ZINC who met in Ostend on Wednesday, July 15, reached an agreement to restrict production next year by 45 per cent. Severe penalties will be inflicted in the case of any parties to the agreement who exceed the amount of production sanctioned. The agreement is for one year only, and may be renounced at three months' notice. The signatories represent Germany, France, Belgium, Poland, Great Britain, Australia, Canada, Czecho-Slovakia, Mexico, and Norway.

A NEW TYPE OF PETROL which, it is claimed, eliminates the danger of fire caused by the fuel catching alight while an aeroplane is in flight or as the result of a crash, was demonstrated by M. Henri Bardel, technical director of the Air Union, at Croydon on Tuesday, July 14. M. Bardel flew from Paris in an Air Union passenger 'plane which was using the new petrol. At Croydon Aerodrome he proved the advantages of the fuel by dropping lighted matches into a bucket of it. The fuel instantly extinguished the match flame, whereas a similar experiment performed with ordinary petrol produced a blaze. This petrol is the invention of a French scientist, M. Ferrier.

THE CHEMICAL RESEARCH LABORATORY of the Department of Scientific and Industrial Research, at Teddington, was open for inspection on Thursday last, July 16, on the occasion of a visit by members of the Society of Chemical Industry. The exhibits shown included laboratory and semi-works scale production of synthetic resins; large scale plant for the study of tars, with a collection of the main constituents of low temperature tars and the application of tar resins as varnishes and moulding materials; a circulatory plant for the high pressure synthesis of methyl and ethyl alcohols, higher alcohols, aldehydes and aliphatic acids; autoclaves in operation, and specimens of chemical products from high pressure condensations; apparatus for the study of base-exchange materials in water softening; and quantitative experiments on the corrosion of zinc, iron and steel immersed in oxygenated salt solutions.

ACCORDING to the United States Trade Commissioner in Tokyo, a Japanese firm in Tokyo is understood to have acquired the patent rights and is expected to organise a company for the exploitation of a process for the production of motor-fuel containing alcohol as a constituent.

A TANK CONTAINING TURPENTINE to the extent of 1,000 gallons was threatened by a fire which destroyed the oil and varnish mixing section of the works of W. W. Hill, Son and Wallace, Ltd., of Long Street, Salford, on Monday, July 13. Two firemen were burned on the hands and face when an oil tank exploded.

A DRUM CONTAINING 2 CWT. OF CALCIUM CARBIDE exploded at the Quay of the Royal Dock at Hull on Monday, July 14, whilst being soldered. Reginald Kirby, a tinsmith employed by the Ellerman Wilson Line, received abrasions on the face and hands, but was allowed to go home after treatment at the local infirmary.

THERE WAS AN UNUSUAL FIRE OUTBREAK at Bristol last week when the city fire brigade and Bristol river fire boat were summoned to the s.s. "Consul Bratt," lying at Prince's Wharf. This vessel was carrying a cargo of potash and timber, and a quantity of potash in the forehold suddenly ignited and smouldered fiercely for some time.

THE HOME SECRETARY has referred to the Departmental Committee on Compensation for Industrial Diseases, of which Sir Humphrey Rolleston is chairman, the question of adding to the schedule of industrial diseases under the Workmen's Compensation Act: (1) Poisoning by sulphuretted hydrogen and its sequelæ; and (2) poisoning by carbon monoxide and its sequelæ.

SUPPRESSION of the export of heroin is one of the outstanding features of the thirty-four articles contained in the International Convention which was adopted on July 12 at the concluding session of the League of Nations Limitation of Narcotics Conference. Other important articles adopted included limitations of raw materials and a provision that the reserve stocks of manufactured drugs are not to exceed 25 per cent. of the estimated consumption needs.

THE PRIME MINISTER OF GREECE (M. Venizelos) will visit Birmingham on Monday next, July 20, for the purpose of inspecting plant at the Nechells Gas Works which, it is believed, will be of great assistance in enabling Greece to deal with the problem of the provision of fuel. By arrangement with the Gas Committee of the City of Birmingham, over sixty tons of Grecian lignite have already been treated in the full-scale test works at these works, and it is expected that similar plant made in Britain will in future be exported to Greece in place of plant hitherto exported from Germany.

MR. W. F. WHITWELL, managing director of the Horden Collieries, has been appointed chairman of the company, in succession to the late Sir Hugh Bell, whose son, Sir Maurice Bell, has been elected to fill the vacancy on the board of directors. For many years he was managing director of William Whitwell and Co., Ltd., the well-known iron manufacturers, of Thornaby-on-Tees, a company which, a few years ago, went out of business. In 1927, following the death of Mr. W. H. Hustler, he became managing director of Horden Collieries, of which he has been a director for eight years.

THE GERMAN RAYON SYNDICATE, which has been formed to provide for the organisation and existence for a period of ten years of a joint rayon selling unit for the entire German rayon industry, as well as part of the foreign industry, will start operations on August 1, through "Kunsteide Verkaufsburo Berlin" (Rayon Sales Co., Berlin), of which the sales organisation of Vereinigte Glanzstoff-Fabriken A.G. forms the nucleus. The companies involved in the agreement are I.G. Farbenindustrie A.G., Vereinigte Glanzstoff-Fabriken A.G., Glanzstoff Courtaulds G.m.b.H., Fr. Kuettner A.G., Spinnstoffabrik Zehlendorf G.m.b.H., Herminghaus and Co., G.m.b.H., Algemeene Kunstzijde Unie, N.V., Hollandsche Kunstzijde Industrie Breda, Swiss and Italian rayon interests. In addition, J.P. Bemberg A.G., I.G. Farbenindustrie A.G., Fr. Kuettner A.G. have formed a cuprammonium syndicate.

Obituary

MR. J. L. AGNEW, vice-president of the International Nickel Co., has died suddenly at Coppercliff, Ontario.

Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Accepted Specifications

346,472. SILICA. C. F. Armstrong, 9, Northumberland Avenue, London. Application date, January 18, 1930.

Kieselguhr which has been used for filtering sugar liquors is agitated with a boiling solution of hydrochloric or other mineral acid and filtered. The cake is washed with hot water and dried with steam.

346,508. AMMONIUM SULPHATE. Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij, 30, Carel van Bylandtlaan, The Hague. International Convention date, February 16, 1929.

Dry ammonia is reacted with sulphur dioxide and the product, $NH_4.SO_2.NH_2$, is treated with water or steam and oxygen or oxidising gases to obtain ammonium sulphate. The first reaction may be effected at ordinary temperature and the second at 100°–120° C., in the presence of cobalt, nickel, iron, cobaltous or nickelous sulphate. The first reaction may be effected in a vertical tube having a stirrer, the walls being cooled to condense the product, which is scraped off and then oxidised.

346,539. PHOSPHORUS AND PHOSPHORUS PENTOXIDE. Victor Chemical Works, Chicago Heights, Chicago. Assignees of H. W. Easterwood, 3210, Long Boulevard, Nashville, Tenn., U.S.A. International Convention date, March 23, 1929.

Phosphate rock, coal, silica and sulphate liquor are briquetted with about 1–3 per cent. of fume obtained by treatment of the briquettes in a blast furnace to produce phosphorus. The phosphorus may then be oxidised to the pentoxide.

346,652. CATALYTIC OXIDATION PROCESSES. Siemens und Halske Akt.-Ges., Siemensstadt, Berlin; W. Noddack and I. Noddack, 15, Karlsbader Strasse, Grunewald, Berlin. Application date, October 8, 1929.

Oxidation processes such as the conversion of sulphur dioxide to trioxide, the oxidation of sulphites to sulphates, and nitrites to nitrates, the oxidation of aniline to aniline black, the decolorisation of an aqueous solution of indigo blue, and the oxidation of other organic substances, are effected with a catalyst consisting of or containing rhenium, or its oxide or a salt. The catalyst may be recovered either by crystallising out the reaction product or by precipitating rhenium sulphide.

346,680. CARBON AND HYDROGEN. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 12, 1929.

Unsaturated hydrocarbons are decomposed at such temperatures below 500° C. that not more than 90 per cent. of the carbon is obtained as carbon black, and the remainder is transformed into saturated hydrocarbons. Catalysts such as cobalt, iron or nickel, with or without activators such as chromium or alkali metal compounds may be employed. Ethylene, butylene, propylene and acetylene may be treated, and the temperature, which should be not more than 50° C. below the upper limit, may be controlled by various means such as water-cooled tubes. In an example, ethylene is treated at 350°–370° C. in the presence of a catalyst obtained by reducing a mixture of cobalt, zinc and barium oxides. The carbon black obtained is purified by treating with hydrochloric or nitric acid, and is suitable as a filler in the vulcanisation of natural or artificial rubber. Other examples of suitable catalysts are given.

346,674. DETINNING SCRAP. J. W. Hinchley, 55, Redcliffe Road, West Brompton, London. Application date, January 14, 1930.

Tin scrap is detinned by means of a solution obtained by dissolving spongy lead in an excess of caustic alkali solution such as soda, in the presence of air. Tin scrap from a machine 10 is fed to tanks 13, 15, and treated with hot caustic alkali solution circulated through filter presses 18. Solder is then removed in a roaster 20, and the scrap passes to a detinning tank 23 containing partly spent solution, and a tank 24 containing fresh solution, and finally a tank 29 containing hot water or caustic alkali, from which the detinned scrap passes to hopper 31. The precipitated spongy lead passes to tank 35

FIG.I.

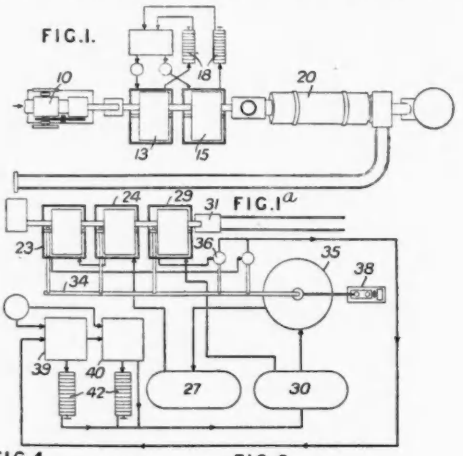


FIG.Ia

FIG.4.

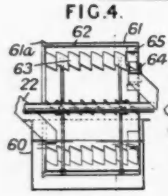
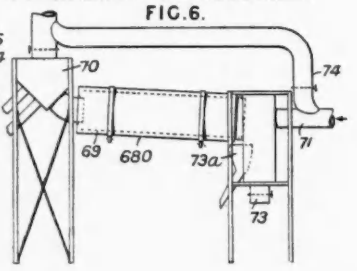


FIG.6.



346,674.

and is dissolved in caustic alkali from tank 30, the regenerated detinning solution thus obtained passing through storage tank 27 back to the tank 24. The tin-containing solution passes through centrifuges 36 to tanks 39, 40, and is treated with milk of lime to precipitate calcium stannate which is removed in filters 42. The detinning tank 60 contains a rotary drum 61 with perforated inner drum 62. The tinplate is circulated by vanes 63 through the tank to discharge 64. The roaster 20 consists of a perforated rotary cylinder 69 into which the scrap is fed from a hopper 70. Flue gas is admitted by pipe 71 to melt off the solder, which is collected by a pipe 73*a*, while the scrap passes to outlet 73.

346,689. DESTRUCTIVE HYDROGENATION. H. D. Elkington, London. From Maamlooze Vennootschap de Bataafsche Petroleum Naatschappij, 30, Carel van Bylandtlaan, The Hague. Application date, December 6, 1929.

Coal, brown coal, lignite or cellulose are treated with hydrogen or carbon monoxide in the presence of catalysts consisting of colloidal tungsten, chromium, uranium, manganese, cobalt, nickel or iron, with or without molybdenum compounds, deposited on absorption carbon or finely divided brown coal. In addition to destructive hydrogenation, the catalysts are employed for the removal of oxygen from phenols and cresols.

346,734. MAGNESIUM PHOSPHATE AND POTASSIUM NITRATE. Chemie-verfahren Ges., 15, Wilhelmstrasse, Bochum, Germany. International Convention date, December 5, 1928. Addition to 329, 939.

Crude phosphate is treated with nitric acid and then with a mixture of potassium and magnesium sulphates or a natural substance such as schonite, leonite or langbeinite. The

amount of magnesium is such that dimagnesium phosphate would be precipitated. Gypsum is separated, and the solution treated with potassium carbonate to precipitate most of the magnesium as dimagnesium phosphate. The remainder is obtained as trimagnesium phosphate by adding further potassium carbonate to the separated liquor. Potassium nitrate is obtained from the mother liquor.

346,355. ANTHRAQUINONE DERIVATIVES. British Celanese, Ltd., 22, Hanover Square, London, E. W. Kirk, H. C. Olpin and G. H. Ellis, of British Celanese, Spondon, near Derby. Application date, January 8, 1930.

Anthraquinone or a derivative is treated with nitrosyl sulphuric acid in the presence of mercury or mercury compound in the proportion of less than 1 per cent., and in the presence of sulphuric acid with or without boric, arsenic or phosphoric acids. Examples are given of the production of quinizarin, 1 : 4 : 5-trioxyanthraquinone, and quinizarin carboxylic acid.

346,359. DYES AND INTERMEDIATES. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, Oct. 30, 1929.

α-Anthraquinonyl-N-isatins or alkyl or halogen derivatives, are halogenated in the presence or absence of organic or inorganic solvents or diluents and halogen transferrers, to obtain anthraquinone acridones and other halogenated products. The products, which are halogenated isatin derivatives, may be treated with acid or alkaline or acid condensing agents to effect acridone ring closure. In an example, 1-N-isatylanthraquinone is treated with sulphuryl chloride in nitrobenzene in presence of iodine to obtain a 1-N-dichlorisatylanthraquinone converted in the vat to a dichloranthraquinone-2 : 1-benzacridone. A number of other examples are given.

346,753. DISTILLING TAR. Barrett Co., 40, Rector Street, New York. Assignees of S. P. Miller, Englewood, N.J., U.S.A. International Convention date, January 10, 1929.

Tar is distilled by direct contact with hot gas from coke ovens to obtain a high melting point pitch, and the hot gases are used

FIG.2.

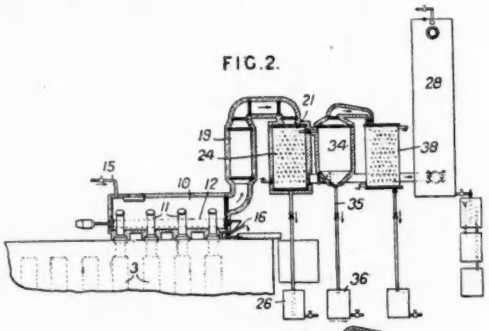
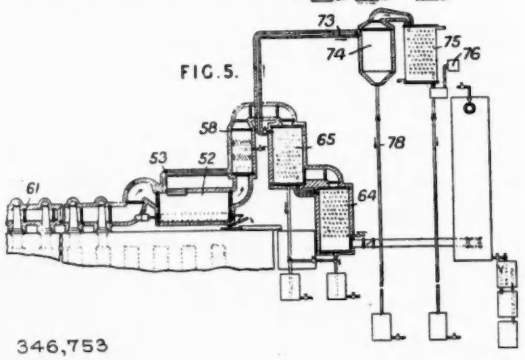


FIG.5.



346,753

to distil a further quantity of tar by indirect contact to obtain a low melting point pitch, while oil is condensed from the hot gases. Tar is supplied continuously through pipe 15 to an insulated still 10 having a rotating roller 12 at one side which sprays the tar into the hot gases supplied through uptakes 11 of a battery of coke ovens 3. Pitch is removed at 16 and the hot gases passed through settling chamber 19 to a tubular heat exchanger 21 in which the second supply of tar is preheated. The hot tar is flashed in chamber 34 from which the pitch of low melting point passes to a receiver 36 while the vapour passes to a condenser 38. The condensate from chamber 21 passes to a receiver 26, and the gases pass to scrubber 28 into which water is sprayed. In a modified apparatus, the coke oven gases are mixed in an insulated header 61 and the tar to be treated is sprayed into a separating chamber 58, from which it passes through pipe 56 to still 52. The hot gases pass through two heat exchangers 65, 64, through which the second supply of tar is heated by passing through in the opposite direction. The tar then passes through pipe 73 to flashing chamber 74, kept at reduced pressure, and from which the low melting point pitch is withdrawn through barometric column 78, while the gases pass to a condenser 75. The pitch obtained from the first still has a melting point of about 400° F., and that from the second still of about 110°-150° F.

346,800. CATALYTIC OXIDATION OF AMMONIA. E. Smith, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, December 11, 1929.

Catalytic gauze for ammonia oxidation is supported on rods of silica sillimanite or other non-metallic refractory with small expansibility. The rods are supported by a frame and by water-cooled metal tubes.

346,801. TITANIUM PIGMENTS. Titan Co., Aktieselskabet Fredriksstad, Norway. International Convention date, December 12, 1928.

Titanium oxide and barium sulphate are precipitated simultaneously, or one is precipitated upon the other, under such conditions that the product contains 45-55 per cent. by weight of TiO_2. The precipitate is washed, and calcined at 1100°-1200° C. to convert the titanium compounds into microcrystalline form. Neutralising agents such as oxides, hydroxides, or carbonates of the alkaline earth metals or magnesium may be added before or during calcination.

346,812. PAINT DRIERS; METAL DERIVATIVES OF HYDROXY-FATTY ACIDS. Borchers Akt.-Ges., Geb., Goslah-on-Harz, Germany. International Convention date, January 23, 1929.

Paint driers having a high metal content are obtained by substituting the hydroxyl hydrogen and also the carboxyl hydrogen of mono- or poly-basic mono- or poly-hydroxy fatty acids, or their glycerine esters, by aluminium, lead, zinc, cobalt, copper, manganese, or bismuth in the presence of saturated or unsaturated non-hydroxylated fatty acids such as oleic or linoleic acids, or vegetable or animal oils or fats. The latter materials render the products soluble in turpentine oil and heavy benzines.

346,835. SULPHUR. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, January 18, 1930.

Crude sulphur is purified by heating with sulphuric, hydrochloric, nitric, or phosphoric acid of 40-50 per cent. concentration. If tarry matter is present, strong oxidising agents such as chromic acid, permanganates, perchlorates or persulphates may be added. The sulphur may be in finely divided form, or liquid at 120°-160°C. under increased pressure, or by adding sulphates or nitrates to the acids.

346,858. CARBON, HYDROGEN CHLORIDE; CRACKING HYDROCARBONS. J. P. Baxter, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, January 23, 1930.

Heavy hydrocarbon oils are vaporised in a heated silica cylinder in the presence of hydrogen chloride and are then cracked at 600°-700° C. and at atmospheric pressure and the products treated with chlorine as described in Specification No. 317,165 (see THE CHEMICAL AGE, Vol. XXI, p. 598). The carbon black obtained is removed and hydrogen chloride equivalent to the chlorine used is separated and treated to regenerate the chlorine, while the excess of hydrogen chloride is returned to the cracking process.

346,883. REGENERATING CATALYSTS. R. Riley, Norton Hall, The Green, Norton-on-Tees, Durham, and Imperial Chemical Industries, Ltd., Millbank, London. Application date, January 31, 1930.

Acetylene and acetaldehyde are hydrated by means of a mercury catalyst in acid solution containing ferric sulphate as oxidising agent. Part of the liquor is withdrawn continuously

and treated with oxygen to regenerate the ferric sulphate, and the treated liquor is then returned to the process. The hydration and oxidation processes may take place in a packed tower or with agitation. The oxygen used for the regeneration may be in part withdrawn continuously or periodically for the removal of inert gases.

346,951. DOUBLE SILICATES. International General Electric Co., Inc., 120, Broadway, New York. Assignees of Allgemeine Elektrizitäts-Ges., 2, Friedrich Karl-Ufer, Berlin. International Convention date, March 21, 1929.

Aluminium oxide or hydroxide, potassium silicate and water are mixed to a thick paste and allowed to set and heated to reduce the water content approximately to that of natural mica. The product is an insulating material resembling mica.

346,991. AMMONIUM NITRATE. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, April 14, 1930. Addition to 326,529. (See THE CHEMICAL AGE, Vol. xxii, p. 468.)

In the process for obtaining mixed fertilisers as described in Specification No. 326,529, magnesium salts are added to the liquid mixture containing ammonium nitrate and one or more other fertilisers in order to increase the surface tension.

347,074. PHOSPHO-TUNGSTATES. Imperial Chemical Industries, Ltd., Millbank, London. International Convention date, July 25, 1929.

Mother liquors obtained in the production of the compounds $3Na_2O.P_2O_5.24WO_3$ and $3Na_2OP_2O_5.16WO_3$ are acidified with hydrochloric acid and treated with aniline, monoethyl- or methyl-aniline, dimethyl- or ethyl-aniline, *o*-toluidine or monoethyl-*o*-toluidine. A complex phospho-tungstate amine is precipitated, free from other salts, and is separated, treated with caustic soda, and steam distilled, to remove the amine and leave a purified phospho-tungstate.

347,129. PIGMENTS, ZINC TITANATES. Goodlass Wall and Lead Industries, Ltd., 3, New London Street, London, and N. J. Read, Research Laboratories, Brimsdown, Middlesex. Application date, January 18, 1930.

White metal oxides such as antimony or tin oxides which form coloured sulphides are mixed with zinc sesqui- or meta-titanates or zinc ortho- or meta-silicate. These compounds are inert towards paint vehicles and react more readily with sulphur compounds than the pigment to form a white sulphide and a white oxide.

Specifications Accepted with Date of Application

351,388–9. Tar, Distillation of. Barrett Co. January 26, 1929.

351,452. Sulphonation products, Preparation of. H. T. Bohme, Akt.-Ges. March 20, 1929.

351,503. Electrolytic production of magnesium. Process of an apparatus for. I.G. Farbenindustrie Akt.-Ges. February 6, 1929.

351,510. Producing metals electrolytically, particularly magnesium, Process and apparatus for. A. C. Jessup. February 28, 1930.

351,518. Acrylic esters form β-chloropropionic acid esters, Manufacture of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) March 24, 1930.

351,524. Aluminium and aluminium alloys, Production of. W. Neumann. March 24, 1930.

351,532. Corrosion-resisting ferrous alloys, Production of. Hall and Pickles, Ltd., and J. Smith. March 26, 1930.

351,548. Calcium benzoate, Production of. T. Goldschmidt Akt.-Ges. April 3, 1929.

351,552. Low-temperature carbonisation and distillation of coal, lignite and oil shale, Process and apparatus for. Intertrust Compagnie Générale de Distillation et Cokefaction à Basse Temperature et Minière Soc. Anon. April 6, 1929.

351,555. Dyes, Manufacture of. F. M. Hamer and Ilford, Ltd. March 28, 1930.

351,557. Vat dyestuffs of the anthraquinone series, Manufacture and production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*). March 28, 1930.

351,576. Separating volatile impurities from solid or liquid hydrocarbons. A. Esau. March 13, 1929.

351,585. Azo-dyestuff, Manufacture of. W. W. Groves. (*I.G. Farbenindustrie Akt.-Ges.*) April 2, 1930.

351,605. Aminoalkoxy compounds useful as antiseptics, Manufacture of. Soc. of Chemical Industry in Basle. April 5, 1929.

351,609. Mixed fertilisers, Production of. A. C. Finch, K. W. Young and Imperial Chemical Industries, Ltd. April 8, 1930.

351,653. Metallic compounds, Reduction of. G. N. Kirsebom May 14, 1929.

351,749. Ammonium-potassium phosphatic fertiliser, also a utilisable slag, Manufacture of. E. Urbain. August 29, 1929.

351,774. Vat-dyestuffs of the anthraquinone series, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 30, 1929.

351,810. Boric acid, Manufacture of. A. Kelly. August 20, 1930.

351,812. Salt-bath furnaces for the heat treatment of steel and other metals. Siemens-Schuckertwerke Akt.-Ges. September 19, 1929. Addition to 21,910/30.

351,825. Utilising waste gases from contact plants for sulphuric acid manufacture. Metallges. Akt. Ges. October 3, 1929.

351,841. Titanium dioxide, Manufacture of. Metal and Thermit Corporation. September 28, 1929.

351,844. Rubber, Preservation of. Goodyear Tire and Rubber Co. November 6, 1929.

351,845. Ammonium carnallite or potassium carnallite, Production of. Kali-Forschungs Anstalt Ges. November 28, 1929.

351,877. Potassium aluminates and phosphates, Separation of. I.G. Farbenindustrie Akt.-Ges. November 23, 1929.

Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

Aische, M. I. Synthetic cyanides. 19,629. July 8.

Bloxam A. G. (Soc. of Chemical Industry in Basle). Manufacture of anthraquinone derivatives. 19,434. July 6.

—— Manufacture of azo dyestuffs, etc. 19,435. July 6.

—— Process for improving materials made from cellulose derivative. 19,436. July 6.

—— Manufacture of vat dyestuffs. 19,561. July 7.

Bradley, W., Imperial Chemical Industries, Ltd., and Robinson, R. Substituted naphthalene derivatives. 19,872. July 10.

Caro, N., and Frank, A. R. Production of ammonium nitrate. 19,947. July 10.

Chinoin Fabrik Chemisch-Pharmaceutischer Produkte Akt.-Ges., and Wolf, E. Manufacture of derivatives of benzylisoquinoline. 19,793. July 9. (Germany, August 1, 1930.)

Compagnie Nationale de Matiéres Colorantes et Manufactures de Produits Chimiques du Nord Réunies, Etablissements Kuhlmann. Manufacture of sulphonated condensation products. 19,796. July 9. (France, August 1, 1930.)

Cunningham, E. A. Electrolytic process for production of azoxybenzene, etc. 19,553. July 7.

Dreyfus, H. Treatment of hydrocarbons. 19,755. July 9.

Greenstreet, C. J. Production of fatty acids from oils, etc. 19,412. July 6.

Groves, W. W. (I.G. Farbenindustrie Akt.-Ges.). Manufacture of azo dyestuffs. 19,442. July 6.

—— Manufacture of azo dyestuffs. 19,562. July 7.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of red mineral colours. 19,673. July 8.

I.G. Farbenindustrie Akt.-Ges. Eliminating sodium carbonate from solutions of potassium carbonate. 19,790. July 9. (Germany, August 20, 1930.)

—— Fireproofing-agents. 19,899. July 10. (Germany, July 10, 1930.)

—— Hardening albuminous substances. 19,900. July 10. (Germany, July 11, 1930.)

Imperial Chemical Industries, Ltd. Manufacture of wetting preparations. 19,386, 19,387. July 6.

—— Production of aryl mercapto compounds. 19,388. July 6.

—— and Mendoza, M. Azo dyestuffs. 19,389. July 6.

—— Shot-gun cartridges. 19,599. July 7.

—— and Seaton, W. A. Manufacture of substituted arylsulphonic acids. 19,661. July 8.

—— Floor coverings, etc. 19,662. July 8.

—— Detergent compositions. 19,795. July 9.

International Industrial and Chemical Co., Ltd., and Wittouck, S. Composite titanium pigments, etc. 19,785. July 9.

Klein, F. Manufacture of red pigment of iron oxide. 19,794. July 9. (Germany, July 11, 1930.)

Manlove, Alliott, and Co., Ltd. Sterilizing and disinfecting. 19,417. July 6.

—— Electrically-operated valve, etc. 19,418. July 6.

Mond Nickel Co., Ltd. Electroplating metals. 20,007. July 11.

—— and Raper, A. R. Electrodeposition of palladium. 20,008. July 11.

Oesterreichisch Amerikanische Magnesit Akt.-Ges. Production of metallic magnesium. 19,391. July 6. (Austria, August 4, 1930.)

Palmer, K. W. Production of aryl mercapto compounds. 19,388. July 6.

Western Chemical Co. (Paisley), Ltd. Production of anticorrosive compositions. 19,735. July 9.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£18 15s. per ton d/d address U.K. in casks.
ACID CHROMIC.—11d. per lb., less 2½% d/d U.K.
ACID HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d, according to purity, strength and locality.
ACID NITRIC, 80° Tw.—Spot, £20 to £25 per ton makers' works, according to district and quality.
ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.
AMMONIA (ANHYDROUS).—Spot, 10d. per lb., d/d in cylinders.
AMMONIUM BICHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export
BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.
BLEACHING POWDER, 35/37%.—Spot, £7 19s. per ton d/d station in casks, special terms for contracts.
BORAX, COMMERCIAL.—Crystals, £13 10s. per ton; granulated, £12 10s. per ton; powder, £14 per ton. (Packed in 1 cwt. bags. carriage paid any station in Great Britain. Prices quoted are for one ton lots and upwards.)
CALCIUM CHLORIDE (SOLID), 70/75%.—Spot, £4 15s. to £5 5s. per ton d/d station in drums.
CHROMIUM OXIDE.—9d. to 9½d. per lb. according to quantity d/d U.K.
CHROMETAN.—Crystals, 3½d. per lb. Liquor, £18 12s. 6d. per ton d/d U.K.
COPPER SULPHATE.—£25 to £25 10s. per ton.
METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 11d. to 2s. 4d. per gall.; pyridinised industrial, 2s. 1d. to 2s. 6d. per gall.; mineralised, 3s. to 3s. 4d. per gall. 64 O.P., 1d. extra in all cases. Prices according to quantity.
NICKEL SULPHATE.—£38 per ton d/d.
NICKEL AMMONIA SULPHATE.—£38 per ton d/d.
POTASH CAUSTIC.—£30 to £33 per ton.
POTASSIUM BICHROMATE CRYSTALS AND GRANULAR.—4½d. per lb. nett d/d U.K., discount according to quantity: ground ½d. per lb. extra.
POTASSIUM CHLORATE.—3¾d. per lb. ex-wharf, London, in cwt. kegs.
POTASSIUM CHROMATE.—8½d. per lb. d/d U.K., or 8d. c.i.f. export.
SALAMMONIAC.—Firsts lump, spot, £40 17s. 6d. per ton d/d address in barrels. Chloride of ammonia, £37 to £45 per ton, carr. paid.
SALT CAKE, UNGROUND.—Spot, £3 10s. per ton d/d station in bulk.
SODA ASH, 58%.—Spot, £6 per ton, f.o.r. in bags, special terms for contracts.
SODA CAUSTIC, SOLID, 76/77° E.—Spot, £14 10s. per ton, d/d station.
SODA CRYSTALS.—Spot, £5 to £5 5s. per ton, d/d station or ex depot in 2-cwt. bags.
SODIUM ACETATE 97/98%.—£21 per ton.
SODIUM BICARBONATE, REFINED.—Spot, £10 10s. per ton d/d station in bags.
SODIUM BICHROMATE CRYSTALS (CAKE AND POWDER)—3½d. per lb. nett d/d U.K., discount according to quantity. Anhydrous ¾d. per lb. extra.
SODIUM BISULPHITE POWDER, 60/62%.—£16 10s. per ton delivered 1-cwt. iron drums for home trade.
SODIUM CHLORATE.—2¾d. per lb.
SODIUM CHROMATE.—3¾d. per lb. d/d U.K., or 3½d. c.i.f. export.
SODIUM NITRITE.—Spot, £19 per ton, d/d station in drums.
SODIUM PHOSPHATE.—£14 per ton, f.o.r. London, casks free.
SODIUM SILICATE, 140° Tw.—Spot, £8 5s. per ton, d/d station returnable drums.
SODIUM SULPHATE (GLAUBER SALTS).—Spot, £4 2s. 6d. per ton, d/d.
SODIUM SULPHIDE SOLID, 60/62%.—Spot, £10 5s. per ton, d/d in free drums. Crystals—Spot, £8 5s. per ton, d/d in free casks.
SODIUM SULPHITE, PEA CRYSTALS.—Spot, £13 10s. per ton, d/d station in kegs. Commercial—Spot, £9 per ton, d/d station in bags.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—4¾d. to 6½d. per lb. Crude 60's 1s. to 1s. 1d. per gall. August/December.
ACID CRESYLIC 99/100.—1s. 9d. to 1s. 10d. per gall. B.P., 3s. 6d. per gall. 97/99.—Refined, 2s. 2d. to 2s. 3d. per gall. Pale, 98%, 1s. 7d. to 1s. 8d. Dark, 1s. 4d. to 1s. 4½d.
ANTHRACENE OIL, STRAINED (GREEN OIL).—4½d. to 4¾d. per gall.
BENZOLE.—Prices at works: Crude, 6½d. to 7½d. per gall.; Standard Motor, 1s. 1d. to 1s. 2d. per gall. 90%.—1s. 2d. to 1s. 3d. per gall. Pure, 1s. 5d. to 1s. 6d. per gall.
TOLUOLE.—90%, 1s. 8d. to 1s. 9d. per gall. Pure, 1s. 10d. to 1s. 11d. per gall.
XYLOL.—1s. 7d. to 1s. 8d. per gall. Pure, 1s. 10d to 1s. 11d. per gall.
CREOSOTE.—Standard specification, for export, 5dd. to 5½d. net per gall. f.o.b.; for Home, 4d. per gall. d/d.
NAPHTHA.—Solvent, 90/160, 1s. 3d. per gall. Solvent, 95/160, 1s. 4d. to 1s. 5d. per gall. Solvent, 90/190, 1s. to 1s. 2d. per gall.
NAPHTHALENE.—Purified Crystals, £10 per ton.
PITCH.—Medium soft, 45s. to 47s. 6d. per ton, in bulk at makers' works.
PYRIDINE.—90/140, 3s. to 3s. 3d. per gall. 90/160, 3s. 3d. to 3s. 6d. per gall. 90/180, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.
ACID ANTHRANILIC.—6s. per lb. 100%.
ACID GAMMA.—Spot, 3s. 3d. per lb. 100% d/d buyer's works.
ACID H.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 2d. per lb. 100% d/d buyer's works.
ACID NEVILLE AND WINTHER.—Spot, 2s. 6d. per lb. 100% d/d buyer's works.
ACID SULPHANILIC.—Spot, 8½d. per lb. 100% d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZALDEHYDE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
BENZIDINE BASE.—Spot, 2s. 3d. per lb. 100% d/d buyer's works.
BENZOIC ACID.—Spot, 1s. 8½d. per lb. d/d buyer's works.
o-CRESOL 30/31° C.—£2 6s. 5d. per cwt., in 1-ton lots.
m-CRESOL 98/100%.—2s. 9d. per lb., in ton lots.
p-CRESOL 34·5° C.—1s. 9d. per lb., in ton lots.
DICHLORANILINE.—2s. 5d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE.—£74 per ton d/d.
DINITROTOLUENE.—48/50° C., 7d. per lb.; 66/68° C., 7¾d. per lb.
DIPHENYLAMINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
a-NAPHTHOL.—Spot, 1s. 9d. per lb. d/d buyer's works.
B-NAPHTHOL.—Spot, £65 per ton in 1 ton lots, d/d buyer's works.
a-NAPHTHYLAMINE.—Spot, 10½d. per lb. d/d buyer's works.
B-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb. d/d buyer's works.
o-NITRANILINE.—5s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 6d. per lb. d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 6½d. per lb., 5-cwt. lots, drums extra, d/d buyer's works.
NITRONAPHTHALENE.—8½d. per lb.
R. SALT.—Spot, 2s. per lb. 100% d/d buyer's works.
SODIUM NAPHTHIONATE.—Spot, 1s. 6d. per lb. 100% d/d buyer's works.
o-TOLUIDINE.—Spot, 8d. per lb., drums extra, d/d buyer's works.
p-TOLUIDINE.—Spot, 1s. 6d. per lb. d/d buyer's works.
m-XYLIDINE ACETATE.—3s. 3d. per lb., 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £7 5s. to £7 10s. per ton. Grey, £12 per ton. Liquor, 9d. per gall.
ACETONE.—£63 to £65 per ton.
CHARCOAL.—£6 to £8 10s. per ton, according to grade and locality.
IRON LIQUOR.—24°/30° Tw., 10d. to 1s. 2d. per gall.
RED LIQUOR.—16° Tw., 8½d. to 10d. per gall.
WOOD CREOSOTE.—1s. 9d. per gall., unrefined.
WOOD NAPHTHA, MISCIBLE.—2s. 9d. to 2s. 11s. per gall., according to quantity. Solvent, 3s. 9d. per gall.
WOOD TAR.—£4 to £5 per ton.
BROWN SUGAR OF LEAD.—£32 per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6d. to 1s. 1d. per lb., according to quality; Crimson, 1s. 3d. to 1s. 5d. per lb., according to quality.
ARSENIC SULPHIDE, YELLOW.—1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—4s. 6d. to 5s. per lb.
CARBON BISULPHIDE.—£26 to £28 per ton, according to quantity; drums extra.
CARBON BLACK.—3d. to 4d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£40 to £50 per ton, according to quantity: drums extra.
CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 6d. per lb.
INDIARUBBER SUBSTITUTES, WHITE.—4⅛d. to 5⅛d. per lb.; Dark, 4½d. to 4⅞d. per lb.
LAMP BLACK.—£28 per ton, barrels free.
LITHOPONE, 30%.—£18 to £20 per ton.
SULPHUR.—£9 10s. to £13 per ton, according to quality.
SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.
SULPHUR PRECIP. B.P.—£55 to £60 per ton, according to quantity.
VERMILION, PALE OR DEEP.—6s. 4d. to 6s. 10d. per lb.
ZINC SULPHIDE.—8d. to 11d. per lb.

Pharmaceutical and Photographic Chemicals

ACETANILIDE.—1s. 4½d. to 1s. 6d. per lb.
ACID, ACETIC, PURE, 80%.—£37 5s. per ton d/d address U.K. in casks.
ACID, ACETYL SALICYLIC.—2s. 7d. to 2s. 9d. per lb., according to quantity.
ACID, BENZOIC B.P.—1s. 10d. per lb., for synthetic product. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz.; 50-oz. lots, 1s. 3d. per oz.
ACID, BORIC B.P.—Crystal, £31 per ton; powder, £32 per ton; For one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
ACID, CAMPHORIC.—19s. to 21s. per lb.
ACID, CITRIC.—11d. per lb., less 5%.
ACID, GALLIC.—2s. 11d. per lb. for pure crystal, in cwt. lots.
ACID, MOLYBDIC.—5s. 3d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ACID, PYROGALLIC, CRYSTALS.—7s. 3d. per lb. for 28-lb. lots; Resublimed, 8s. 6d. per lb. for 28-lb. lots, d/d.
ACID, SALICYLIC, B.P. PULV.—1s. 5d. to 1s. 8d. per lb. Technical.—1s. to 1s. 2d. per lb.
ACID, TANNIC B.P.—2s. 8d. to 2s. 10d. per lb.
ACID, TARTARIC.—11d. per lb., less 5%.
AMIDOL.—7s. 6d. to 11s. 3d. per lb., according to quantity.
AMMONIUM BENZOATE.—3s. 6d. per lb.
AMMONIUM CARBONATE B.P.—£36 per ton. Powder, £39 per ton in 5-cwt. casks. Resublimated, 1s. per lb.
AMMONIUM MOLYBDATE.—4s. 9d. per lb. in ¼-cwt. lots. Packages extra. Special prices for quantities and contracts.
ATROPHINE SULPHATE.—7s. to 7s. 6d. per oz., according to quantity.
BARBITONE.—5s. 9d. to 6s. per lb.
BENZONAPHTHOL.—2s. 10d. per lb.
BISMUTH CARBONATE.—7s. 9d. per lb.
BISMUTH CITRATE.—8s. 7d. per lb.
BISMUTH SALICYLATE.—7s. 11d. per lb.
BISMUTH SUBNITRATE.—6s. 9d. per lb.
BISMUTH NITRATE.—Cryst. 5s. 6d. per lb.
BISMUTH OXIDE.—10s. 9d. per lb.
BISMUTH SUBCHLORIDE.—10s. 5d. per lb.
BISMUTH SUBGALLATE.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
BISMUTHI ET AMMON LIQUOR.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts. 11d. per lb. Liquor Bismuth B.P., in W. Qts., 1s. 2½d. per lb.; 6 W. Qts., 1s. per lb.; 12 W. Qts., 10½d. per lb.; 36 W. Qts., 10d. per lb.
BORAX B.P.—Crystal, £21 10s. per ton; powder, £22 per ton; for one-ton lots and upwards. Packed in 1-cwt. bags carriage paid any station in Great Britain.
BROMIDES.—Ammonium, 1s. 9d. per lb.; potassium, 1s. 4½d. per lb.; granular, 1s. 5d. per lb.; sodium, 1s. 7d. per lb. Prices for 1-cwt. lots.
CAFFEIN, PURE.—6s. 6d. per lb.
CAFFEIN CITRAS.—5s. per lb.
CALCIUM LACTATE.—B.P., 1s. 1½d. to 1s. 3d. per lb., according to quantity.
CAMPHOR.—Refined flowers, 2s. 10d. to 3s. per lb., according to quantity; also special contract prices.
CHLORAL HYDRATE.—2s. 11½d. to 3s. 1½d. per lb.
CHLOROFORM.—2s. 3d. to 2s. 6d. per lb., according to quantity.
ETHERS.—S.G. ·730—1s. 1d. to 1s. 2d. per lb., according to quantity; other gravities at proportionate prices.
FORMALDEHYDE, 40%.—30s. per cwt., in barrels, ex wharf.
GLUCOSE, MEDICINAL.—1s. 6d. to 2s. per lb. for large quantities.
HEXAMINE.—1s. 10d. to 2s. per lb., according to quantity.
HYDROGEN PEROXIDE (12 VOLS.).—1s. 4d. per gallon, f.o.r. makers' works, naked. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 3s. per gall.
HYDROQUINONE.—4s. 7d. per lb. in 1-lb. lots; 3s. 5½d. per lb. in cwt. lots.
HYPOPHOSPHITES.—Calcium, 2s. 11d. to 3s. 4d. per lb.; potassium, 3s. 2d. to 3s. 7d. per lb.; sodium, 3s. 1d. to 3s. 6d. per lb.; for 28-lb. lots.
IRON AMMONIUM CITRATE.—B.P., 1s. 9d. per lb., for 28-lb. lots. Green, 2s. 6d. per lb., list price. U.S.P., 2s. 7d. per lb. list price.
IRON PERCHLORIDE.—18s. to 20s. per cwt., according to quantity.
IRON QUININE CITRATE.—B.P., 8½d. to 8¾d. per oz.
MAGNESIUM CARBONATE.—Light B.P., 36s. per cwt.
MAGNESIUM OXIDE.—Light Commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
MENTHOL.—A.B.R. recrystallised B.P., 14s. 6d. per lb. net; Synthetic, 8s. 6d. to 12s. per lb.; Synthetic detached crystals, 8s. 6d. to 10s. per lb., according to quantity; Liquid (95%), 9s. per lb.
MERCURIALS B.P.—Up to 1-cwt. lots, Red Oxide, crystals, 7s. 4d. to 7s. 5d. per lb., levig., 6s. 11d. to 7s. per lb.; Corrosive Sublimate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 3d. to 5s. 4d. per lb.; White Precipitate, Lump, 5s. 10d. to 5s. 11d. per lb., Powder, 5s. 11d. to 6s. per lb.; Calomel, 6s. 3d. to 6s. 4d. per lb.; Yellow Oxide, 6s. 9d. to 6s. 10d. per lb.; Persulph, B.P.C., 6s. 1d. to 6s. 2d. per lb.; Sulph. nig., 6s. 5d. to 6s. 6d. per lb. Special prices for larger quantities.
METHYL SALICYLATE.—1s. 3d. to 1s. 4d. per lb.
PARAFORMALDEHYDE.—1s. 6d. per lb.
PARALDEHYDE.—1s. 1d. per lb.
PHENACETIN.—3s. 9d. to 4s. 1d. per lb.
PHENOLPHTHALEIN.—5s. to 5s. 2½d. per lb.
POTASSIUM BITARTRATE 99/100% (Cream of Tartar).—80s. per cwt., less 2½ per cent.
POTASSIUM CITRATE.—B.P., 1s. 7d. per lb. for 28-lb. lots.
POTASSIUM FERRICYANIDE.—1s. 7½d. per lb., in 125-lb. kegs.
POTASSIUM IODIDE.—16s. 8d. to 17s. 9d. per lb., as to quantity.
POTASSIUM METABISULPHITE.—50s. per cwt. d/dLondon, kegs free.
POTASSIUM PERMANGANATE.—B.P. crystals, 5½d. per lb., spot.
QUININE SULPHATE.—1s. 8d. per oz. for 1,000-oz. lots.
SACCHARIN.—43s. 6d. per lb.
SALICIN.—16s. 6d. to 17s. 6d. per lb., according to quantity.
SILVER NITRATE.—10d. per oz. for 500-oz. lots, sticks, 2d. per oz. extra.
SODIUM BARBITONUM.—8s. 6d. to 9s. per lb. for 1-cwt. lots.
SODIUM BENZOATE B.P.—1s. 6½d. to 1s. 7½d. per lb.
SODIUM CITRATE.—B.P.C. 1911, 1s. 4d. per lb. B.P.C. 1923, and U.S.P., 1s. 8d. per lb. for 28-lb. lots.
SODIUM HYPOSULPHITE, PHOTOGRAPHIC.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
SODIUM NITROPRUSSIDE.—16s. per lb.
SODIUM POTASSIUM TARTRATE (ROCHELLE SALT).—75s. per cwt. net, ton lots, d/s of 5 cwt. Crystals, 2s. 6d. per cwt. extra.
SODIUM SALICYLATE.—Powder, 1s. 10d. to 2s. 2d. per lb. Crystal, 1s. 11d. to 2s. 3d. per lb.
SODIUM SULPHIDE, PURE RECRYSTALLISED.—10d. to 1s. 2d. per lb.
SODIUM SULPHITE, ANHYDROUS.—£26 to £28 per ton, according to quantity. Delivered U.K.
STRYCHNINE, ALKALOID CRYSTAL, 2s. per oz.; hydrochloride, 1s. 9½d. per oz.; nitrate, 1s. 8d. per oz.; sulphate, 1s. 9d. per oz., for 1,000-oz. quantities.
TARTAR EMETIC, B.P.—Crystal or powder, 1s. 9d. to 2s. per lb.
THYMOL.—Puriss, 6s. 1½d. to 7s. per lb., according to quantity. Natural, 12s. per lb.
ZINC STEARATE.—1s. 4d. to 1s. 6d. per lb.

Perfumery Chemicals

ACETOPHENONE.—7s. per lb.
AUBEPINE (EX ANETHOL).—9s. per lb.
AMYL ACETATE.—2s. 3d. per lb.
AMYL BUTYRATE.—4s. 9d. per lb.
AMYL CINNAMIC ALDEHYDE.—9s. per lb.
AMYL SALICYLATE.—2s. 6d. per lb.
ANETHOL (M.P. 21/22° C.).—5s. per lb.
BENZALDEHYDE FREE FROM CHLORINE.—2s. 6d. per lb.
BENZYL ACETATE FROM CHLORINE-FREE ALCOHOL.—1s. 9d per lb.
BENZYL ALCOHOL FREE FROM CHLORINE.—1s. 9d. per lb.
BENZYL BENZOATE.—2s. 2d. per lb.
CINNAMIC ALDEHYDE NATURAL.—11s. 9d. per lb.
COUMARIN.—12s. per lb.
CITRONELLOL.—6s. 6d. per lb.
CITRAL.—6s. 6d. per lb.
ETHYL CINNAMATE.—6s. 9d. per lb.
ETHYL PHTHALATE.—2s. 6d. per lb.
EUGENOL.—8s. per lb.
GERANIOL.—6s. to 10s. per lb.
GERANIOL (FROM PALMAROSA).—15s. per lb.
HELIOTROPINE.—5s. 6d. per lb.
ISO EUGENOL.—9s. 6d. per lb.
LINALOL (EX BOIS DE ROSE).—5s. 6d. per lb.
LINALYL ACETATE, EX BOIS DE ROSE.—7s. per lb. Ex Shui Oil, 7s. 6d. per lb.
METHYL ANTHRANILATE.—6s. 3d. per lb.
METHYL BENZOATE.—4s. 3d. per lb.
MUSK XYLOL.—6s. 6d. per lb.
PHENYL ETHYL ACETATE.—10s. per lb.
PHENYL ETHYL ALCOHOL.—8s. 3d. per lb.
RHODINOL.—40s. per lb.
SAFROL—1s. 6d. per lb.
VANILLIN, EX CLOVE OIL.—14s. 6d. to 16s 6d. per lb. Ex Guaiacol.—13s. to 15s. per lb.

Essential Oils

ANISE OIL.—2s. 6d. per lb.
BERGAMOT OIL.—8s. 6d. per lb.
BOURBON GERANIUM OIL.—17s. 6d. per lb.
CAMPHOR OIL.—White, 2s. per lb.; Brown, 1s. 6d. per lb.
CANANGA.—Java, 8s. per lb.
CINNAMON OIL LEAF.—4s. per oz.
CITRONELLA OIL.—Java, 2s. 3d. per lb., c.i.f. Pure Ceylon, 2s. per lb.
CLOVE OIL, 90/92%.—6s. 6d. per lb.
EUCALYPTUS OIL, AUSTRALIAN, B.P. 70/75%—1s. 5d. per lb.
LAVENDER OIL.—Mont Blanc, 38/40%, 9s. per lb.
LEMON OIL.—4s. 3d. per lb.
LEMONGRASS OIL.—3s. per lb.
ORANGE, SWEET.—8s. per lb.
OTTO OF ROSE.—Anatolian, 45s. per oz.; Bulgarian, 65s. per oz.
PALMA ROSA.—9s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, July 16, 1931.

MARKETS have continued on quietly steady lines, there being a fair average of inquiry coming to hand and prices remain steady.

General Chemicals

ACETONE.—Unchanged at £60 to £63 per ton according to quantity, with the product being in regular request.

ACID ACETIC.—£36 5s. to £38 5s. for technical 80%, and £37 5s. to £39 5s. for pure 80%, with the market receiving regular demands.

ACID CITRIC.—There is no improvement in the demand and price remains easy at 11½d. per lb., less 5%.

ACID, FORMIC.—In little better request, with the market steady at £37 per ton.

ACID, OXALIC.—Has been freely called for and the market is firm at £34 per ton.

ACID, TARTARIC.—Has been in a little better demand with the price unchanged at about 11d. per lb., less 5%.

ALUMINA SULPHATE.—Unchanged at £7 5s. to £8 5s. per ton for 17/18% iron free material, with a fairly good demand.

ARSENIC.—Cornish material is not available for the time being and the market is nominal at about £20 per ton. Imported material available at about £19 to £19 10s.

CREAM OF TARTAR.—A fair amount of business has been concluded with the market steadier at about 79s. per cwt., ex warehouse London.

COPPER SULPHATE.—Demand has been very active with material rather in short supply for early delivery. The market continues fairly firm at about £21 per ton, free on rails London.

FORMALDEHYDE.—A regular demand is being received with the market steady at about £28 per ton.

LEAD ACETATE.—White is quoted at about £31 15s. per ton; brown, £1 per ton less, with an improved demand.

LITHOPONE.—In steady request at about £18 to £22 per ton, according to grade and quantity.

POTASSIUM BICHROMATE.—Firm at 4¼d. per lb., with discounts for contracts, and in fair demand.

POTASSIUM CHLORATE.—£28 to £32 per ton, and there is a fair amount of business

PERMANGANATE OF POTASH.—Demand has been somewhat better than of late and the price is firm at 5¼d. to 5½d. per lb., ex warehouse London for B.P. needle crystals.

SODIUM BICHROMATE.—The market is firm at 3½d. per lb., with discounts for contracts and in steady request.

SODIUM HYPOSULPHITE.—Photographic crystals continue in good demand at £14 5s. per ton, with the commercial product quoted at £8 10s. per ton.

SODIUM PRUSSIATE.—Firm at 4¾d. to 5¼d. per lb.

TARTAR EMETIC.—Unchanged at 10½d. per lb. with a small demand.

ZINC SULPHATE.—In rather better demand at £10 10s. per ton.

Coal Tar Products

THERE is no change to report in the coal tar products market. Stocks are practically exhausted, but prices remain unchanged.

MOTOR BENZOL.—Unchanged at about 1s. 4½d. to 1s. 5½d. per gallon f.o.r.

SOLVENT NAPHTHA.—Quoted at about 1s. 1½d. to 1s. 2d. per gallon f.o.r.

HEAVY NAPHTHA.—Remains at about 11d. to 1s. 0½d. per gallon f.o.r.

CREOSOTE OIL.—Worth about 3d. to 3½d. per gallon f.o.r. in the North, and about 4d. to 4½d. per gallon in London.

CRESYLIC ACID.—Obtainable at about 1s. 8d. per gallon for the 98/100% quality, and at about 1s. 6d. per gallon for the dark quality 95/97%.

NAPHTHALENES.—Remain at about £3 10s. to £3 15s. per ton for the firelighter quality, at about £4 to £4 5s. per ton for the 74/76 quality, and at about £5 per ton for the 76/78 quality.

PITCH.—Quoted at about 42s. 6d. to 45s. per ton, f.o.b. East Coast port, for forward delivery.

Nitrogen Fertilisers

As the prices for the new season have not yet been fixed, there is nothing to add to our report of last week respecting the market for sulphate of ammonia and nitrate of soda.

Latest Oil Prices

LONDON, July 15.—LINSEED OIL was quiet and 5s. to 7s. 6d. lower. Spot, £17 5s., ex mill; July, £16 5s.; July-August, £16 7s. 6d.; September-December, £16 10s.; January-April, £17 5s., naked. RAPE OIL was dull and 10s. down. Crude extracted, £26 10s.; technical, refined, £28, naked, ex wharf. COTTON OIL was quiet and 10s. lower. Egyptian, crude, £20; refined common edible, £23; deodorised, £25, naked, ex mill. TURPENTINE was easy. American, spot, 47s.; September-December, 40s. per cwt.

HULL.—LINSEED OIL, spot to December closed at £16 15s., naked; January-April at £17 5s. COTTON OIL, Bombay, unquoted; Egyptian, crude, spot, £19 15s.; edible, refined, spot, £22 5s.; technical, spot, £21 15s.; deodorised, £24 5s. PALM KERNEL OIL, crude, naked, f.m.q., spot, £21. GROUNDNUT OIL, crushed/extracted, spot, £24 10s.; deodorised, £28 10s. RAPE OIL, crushed/extracted, spot, £25 10s.; refined, £27 10s. SOYA OIL, crushed/extracted, spot, £17 10s.; deodorised, £21 per ton. CASTOR OIL, pharmacy, spot, 40s. 6d.; firsts, 35s. 6d.; seconds, 33s. 6d. per cwt. COD OIL, 18s. per cwt. TURPENTINE, spot, 49s. 3d. per cwt.

South Wales By-Products

THERE is slightly better conditions prevailing in South Wales by-products. There is a better call for pitch, some of the big users, especially the patent fuel makers, having come into the market. There is no change in values. Road tar continues to have a fair, steady call round about 13s. per 40-gallon barrel. Refined tars are also a good feature, the demand for coke oven and gasworks tar being steady and good. There is no change in values. Naphthas continue to be slow, both solvent and heavy being unsatisfactory. Patent fuel exports are better, while there is also a small improvement in coke exports. Patent fuel prices, for export, are: 20s. to 20s. 6d., ex-ship Cardiff; 19s. to 19s. 6d., ex-ship Swansea. Coke prices are: Best foundry, 34s. to 36s. 6d.; good foundry, 22s. 6d. to 25s.; furnace, 16s. 6d. to 17s. 6d.

Scottish Coal Tar Products

DISTILLERS are firmer in their ideas for forward delivery but consumers are content to purchase from hand to mouth. The heavy products remain in fair call but acids and spirits are weak.

Cresylic Acid.—Trading remains slow with quotations unchanged. Pale, 99/100%, 1s. 5d. to 1s. 6d. per gallon; pale, 97/99%, 1s. 3d. to 1s. 4d. per gallon; dark, 97/99%, 1s. 2d. to 1s. 3d. per gallon; all f.o.r. in bulk. High boiling is steady at 2s. to 2s. 3d. per gallon.

Carbolic Sixties.—With orders scarce value is nominal at 1s. 1d. to 1s. 3d. per gallon f.o.r. in bulk.

Creosote Oil.—Current production finds a ready outlet in the home market. Specification oils, 2¼d. to 3d. per gallon; washed oil, 3¼d. to 3½d. per gallon; gas works ordinary, 3½d. to 3¾d. per gallon; all in bulk f.o.r.

Coal Tar Pitch.—Makers are firm but few orders are being placed. Export value is 40s. to 42s. 6d. per ton f.o.b. Glasgow and home value is 35s. to 37s. 6d. per ton f.o.r. works.

Blast Furnace Pitch is in moderate request at controlled prices, viz., 30s. per ton f.o.r. works for home trade, and 35s. per ton f.a.s. Glasgow for export.

Refined Coal Tar.—Throughout is well maintained and value remains steady at 2¼d. to 2¾d. per gallon naked f.o.r. maker's works.

Blast Furnace Tar.—Unchanged at 2¾d. per gallon.

Crude Naphtha.—Available supplies are on offer at 4¼d. to 5¼d. per gallon according to quality.

Water White Products.—Market is disappointing and fairly heavy stocks are being carried. Motor Benzole is 1s. 4d. to 1s. 5d. per gallon; 90/160 solvent is 1s. 3d. to 1s. 4d. per gallon, and 90/190 heavy solvent, 1s. 1d. to 1s. 2d. per gallon.

New Zinc White Plant in Poland

IT IS REPORTED that a new plant manufacturing zinc white started operations in Poland during the latter part of April. The enterprise is owned by the Polskie Zaklady Przemyslowe S.A., of Bedzin, producers of zinc and tin products, with a capital of 3,000,000 zlote. The equipment of the plant is of the most modern type and may be adjusted to increase the present annual capacity of 3,000 to 5,000 tons of zinc white. Notwithstanding the present market trend of the pigment and low domestic purchasing power, the plant management expects to place half of its output on the domestic market and the balance in foreign countries.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing this firm's independent and impartial opinions.

Glasgow, July 14, 1931.

THE approaching Glasgow Fair holidays are having an effect on the Scottish heavy chemical market, business being quiet.

Industrial Chemicals

ACETONE.—B.G.S.—£60 to £63 per ton, ex wharf, according to quantity.

ACID, ACETIC.—Prices ruling are as follows: glacial, 98/100%, £47 to £58 per ton; pure, £37 5s. per ton; technical, 80%, £36 5s., delivered in minimum lots of 1 ton.

ACID, BORIC.—Granulated commercial, £22 per ton; crystals, £23 per ton; B.P. crystals, £31 per ton; B.P. powder, £32 per ton, in 1-cwt. bags, delivered Great Britain free in one-ton lots upwards.

ACID, HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. per carboy, ex works, full wagon loads.

ACID, NITRIC, 80° QUALITY.—£23 per ton, ex station, full truck loads.

ACID, OXALIC.—98/100%.—On offer at 3¼d. per lb., ex store. On offer from the Continent at 3¼d. per lb., ex wharf.

ACID, SULPHURIC.—£3 7s. 6d. per ton, ex works, for 144° quality, £5 15s. per ton for 168°. Dearsenicated quality, 20s. per ton extra.

ACID, TARTARIC, B.P. CRYSTALS.—Quoted 1s. per lb., less 5%, ex wharf. On offer for prompt delivery from the Continent at 11¾d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—Quoted round about £8 10s. per ton, ex store.

ALUM, LUMP POTASH.—Now quoted £8 10s. per ton., c.i.f. U.K. ports. Crystal meal, about 2s. 6d. per ton less.

AMMONIA ANHYDROUS.—Quoted 10½d. per lb., containers extra and returnable.

AMMONIA CARBONATE.—Lump quality quoted £36 per ton. Powdered, £38 per ton, packed in 5 cwt. casks, delivered U.K. stations or f.o.b. U.K. ports.

AMMONIA LIQUID, 80°.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE.—Spot material obtainable at round about £24 per ton, ex wharf. On offer for shipment from China at about £22 per ton, c.i.f. U.K.

ARSENIC, WHITE POWDERED.—Quoted £22 10s. per ton, ex wharf Spot material still on offer at £22 15s. per ton, ex store.

BARIUM CHLORIDE.—In good demand and price about £9 10s. per ton, c.i.f. U.K. ports. For Continental materials our price would be £8 10s. per ton, f.o.b. Antwerp or Rotterdam.

BLEACHING POWDER.—British manufacturers' contract price to consumers unchanged at £6 15s. per ton, delivered in minimum 4-ton lots. Continental now offered at about the same figure.

CALCIUM CHLORIDE.—Remains unchanged. British manufacturers' price, £4 15s. to £5 5s. per ton, according to quantity and point of delivery. Continental material on offer at £4 7s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—At about £3 15s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports.

FORMALDEHYDE, 40%.—Now quoted £29 per ton, ex store. Continental on offer at about £27 per ton, ex wharf.

GLAUBER SALTS.—English material quoted £4 10s. per ton, ex station. Continental on offer at about £3 per ton, ex wharf.

LEAD, RED.—Price now £30 per ton, delivered buyers' works.

LEAD, WHITE.—Quoted £38 per ton, carriage paid.

LEAD ACETATE.—White crystals quoted round about £32 to £34 per ton c.i.f. U.K. ports. Brown on offer at about £1 per ton less.

MAGNESITE, GROUND CALCINED.—Quoted £9 10s. per ton, ex store.

METHYLATED SPIRIT.—Industrial quality 64 o.p. quoted 1s. 8d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—Quoted 4½d. per lb., delivered U.K. or c.i.f. Irish ports, with an allowance for contracts.

POTASSIUM CARBONATE.—Spot material on offer, £25 10s. per ton ex store. Offered from the Continent at £24 15s. per ton, c.i.f. U.K. ports.

POTASSIUM CHLORATE, 99¾/100% POWDER.—Quoted £26 15s. per ton ex store; crystals 30s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £20 17s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton ex store.

POTASSIUM PERMANGANATE B.P. CRYSTALS.—Quoted 5½d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 7d. per lb. ex store. Offered for prompt delivery from the Continent at about 6¾d. per lb. ex wharf.

SODA, CAUSTIC.—Powdered 98/99%, £17 10s. per ton in drums, £18 15s. in casks. Solid 76/77% £14 10s. per ton in drums, £14 12s. 6d. per ton for 70/72% in drums; all carriage paid buyer's station, minimum four-ton lots; for contracts 10s. per ton less.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3½d. per lb., delivered buyer's premises, with concession for contracts.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station; powdered or pea quality, 7s. 6d. per ton extra. Light soda ash, £7 13s. per ton, ex quay, minimum four-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £9 2s. 6d. per ton, ex station, minimum four-ton lots. Pea crystals on offer at £15 per ton, ex station, minimum four-ton lots.

SODIUM NITRATE.—Chilean producers now offer at £10 per ton, carriage paid, buyer's sidings, minimum six-ton lots.

SODIUM PRUSSIATE.—Quoted 5½d. per lb., ex store. On offer at 5d. per lb., ex wharf, to come forward.

SODIUM SULPHATE (SALTCAKE).—Price, 60s. per ton, ex works; 65s. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption: solid 61/62%, £10 per ton; broken, 60/62%, £11 per ton; crystals 30/32%, £8 2s. 6d. per ton, delivered buyers' works on contract, minimum four-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 10s. per ton; rock, £9 5s. per ton; ground American, £8 10s. per ton, ex store.

ZINC CHLORIDE 98%.—British material now offered at round about £18 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Quoted £11 per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Chemical Manufacturer's Failure

MR. GEORGE HAROLD WILKINSON, chemical manufacturer, trading as The Wrekin Chemical Co., Wrekin Chemical Works, Stirchley, Salop, appeared at Shrewsbury recently for his public examination. The failure was attributed to "competition from combines, foreign importation (duty free) on a large scale; prolonged trade depression, especially in the textile and non-ferrous metal trades." A statement of affairs had been lodged which showed gross liabilities of £12,329, of which £9,416 was expected to rank for dividend, against assets of £416.

Debtor, in reply to questions, said that the business was originally commenced by his grandfather, and in 1901 the debtor was taken into partnership with his father. In 1929 the partnership was dissolved, and the debtor's father died in 1930. In 1926 there was a loss of trade through the coal strike, and a further loss in 1927. In 1928, however, a profit was made. The debtor explained that he had suffered from competition by large combine firms, who undercut him. He became aware of his position about fourteen months ago. In 1930 he began with contracts which, if realised, would have resulted in a profit of about £1,000, but the trade slump in the summer months of last year had affected his business, and at the end of the year he had sustained a loss. The examination was closed.

Revision of Axle Weights

MR. F. G. GODDARD, director of the Sentinel Waggon Works, Shrewsbury, writes: We are pleased to be able to inform you that the Minister of Transport has given favourable consideration to the representations made to him by the steam road vehicle makers on the subject of axle weights. A new amendment order has now been issued legalising an additional two tons of laden weight for four-wheeled steam vehicles licensed before January 1, 1932. Thereafter all four-wheeled steamers on pneumatic tyres will be allowed one ton extra, *i.e.*, 13 tons gross weight at 20 m.p.h. This means that existing "Sentinels," "Super-Sentinels" and "Sentinel" D.G. 4's are now legal with two tons more pay load than previously, and that any new "Sentinel" four-wheeled vehicle licensed before the end of this year will enjoy a similar advantage.

Manchester Chemical Market

(From Our Own Correspondent.)

Manchester, July 16, 1931.

If they have not actually had a restrictive influence on business international developments during the past week have been depressing and the tone of the chemical market here has been somewhat less cheerful than it was several weeks ago when the statement of Mr. Hoover was published. The movement of chemicals in the textile trades, owing to the fact that the holidays are succeeding one another in quick succession in the industrial towns, is being seasonally restricted, thus adding to the difficulties consequent on the cotton trade slackness. Altogether, therefore, business can only be described as of moderate dimensions.

Heavy Chemicals

Offers of bicarbonate of soda are fully maintained at about £10 10s. per ton, and a fair amount of business is being done. In the case of sulphide of sodium, buying interest is on quiet lines without any change in the price position, the 60-65 per cent. solid quality being quoted at round £9 per ton and the commercial material at £7 15s. Prussiate of soda meets with a moderate enquiry, with offers on the basis of 4¾d. to 5¼d. per lb., according to quantity. There is not much business passing in chlorate of soda but prices have been about maintained at up to £26 10s. per ton. Saltcake is steady and in fair request at from £2 17s. 6d. to £3 per ton. Phosphate of soda is quoted at round £10 10s. per ton for the dibasic material, a quiet trade being put through. Caustic soda continues very firm at from £12 15s. to £14 per ton, according to grade and in contracts, with the demand on fairly active lines. Bichromate of soda meets with a moderate amount of enquiry and offers keep up at 3½d. per lb., less 1 to 2½ per cent., according to quantity. Alkali is firm at about £6 per ton, and a fair movement of this material has been reported. With regard to hyposulphite of soda, a quiet business is passing with prices at round £15 per ton for the photographic quality and £9 5s. for the commercial.

The movement of caustic potash is not particularly brisk on this centre and prices are not too strong, offers this week being at round £27 10s. per ton. There is a quiet demand about in the case of permanganate of potash, which is quoted at about 5d. per lb. for the commercial product and 5¼d. for the B.P. grade. Chlorate of potash has been on the slow side this week but prices are still in the neighbourhood of £27 10s. per ton. Bichromate of potash is attracting moderate attention and offers keep up on the basis of 4¼d. per lb., less 1 to 2½ per cent., according to quantity. Yellow prussiate of potash is maintained at from 6¾d. to 7¼d. per lb., and a fair business in this material is being put through. Carbonate of potash is on the easy side at from £24 to £24 10s. per ton, no more than a quiet business being reported during the past week.

Supplies of arsenic are not excessive and quotations are firm at round £19 15s. per ton, at the mines, for white powdered, Cornish makes. With regard to sulphate of copper, sales are on a disappointing scale and in view of the renewed weakness of the metal values at round £18 10s. per ton, f.o.b. are not particularly strong. Nitrate of lead is in quite demand at £29 per ton, with white and brown acetate at £32 10s. and £31. Although still easy in tendency there has been little further change in the position of the acetates of lime, the grey material being on offer this week at about £12 per ton and the brown at £7 10s.

Acids and Tar Products

Oxalic acid is steady at about £1 14s. per cwt., ex store, although only a quiet trade is going through. Citric acid continues to be offered at from 11¾d. to 1s. per lb., with tartaric acid somewhat easier again at about 11d. per lb. Acetic acid is firm and there is a fair volume of enquiry on the basis of £37 per ton for the 80 per cent. commercial quality and £51 for the technical glacial.

Pitch is steady and in moderate enquiry in respect of the next export season at from 42s. 6d. to 47s. 6d. per ton, f.o.b. Creosote oil is still moving in relatively small quantities, with offers ranging from 3d. to 4d. per gallon, naked, according to grade. Carbolic acid is quiet but about unchanged on balance at round 1s. 2d. to 1s. 3d. per gallon, naked, for 60's crude, and 5¼d. per lb., f.o.b., for crystals. Solvent naphtha is on offer at about 1s. 2d. per gallon.

Company News

John Knight, Ltd.—The directors have declared a dividend of 12½ per cent. on the 25 per cent. cumulative preferred ordinary shares, payable July 31, for the half-year to June 30, 1931.

Anton Jurgens' Vereenigde Fabrieken.—An interim dividend of 3 per cent. in respect of the half-year ended June 30, 1931, on all classes of preference shares is announced, payable August 1.

Acetate Products Corporation.—For the period from December 1, 1929, to December 31, 1930, a net loss of £28,223 was reported. The auditors' report states that the greater part of the amounts in arrear on shares (£45,427) appears to be irrecoverable.

Champion and Slee.—The trading profit for 1930 was £26,165 (against £15,564 for the previous 15 months). To directors' fees is placed £300, to depreciation £5,001, to preference dividend £4,200, to dividend of 25 per cent. on the ordinary £17,500, leaving to be carried forward £165.

Australian Commonwealth Carbide Co.—The report for the year ended January 31, 1931, states that the sales of carbide were below those of previous year. The net profit, after making allowances for depreciation, Australian income tax, etc., was £2,387. The directors recommend that £1,500 be written off underwriting commission and £1,136 from preliminary expenses, leaving £211 to be carried forward, against £460 brought in.

New Chemical Trade Marks

Applications for Registration

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52, Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the registration of the following trade marks can be lodged up to August 1, 1931.

Nutri-cel.

523,223. Class 3. Chemical substances prepared for use in medicine and pharmacy. Amelia Elsie Swin-Dell, trading as Nutri-Cel Laboratories, 118, Southampton Road, London, W.C.1; manufacturer. June 1, 1931.

Basifirm.

522,963. Class 4. Raw or partly prepared mineral substances for use in the manufacture of furnace linings. Canadian Refractories, Ltd. (a company incorporated under a charter of the Dominion of Canada), 101, Murray Street, Montreal, Canada; manufacturers. May 21, 1931.

World Nitrate Agreement

Breakdown of Negotiations

The negotiations for a world nitrate agreement, which should have been concluded by July 1, the beginning of the nitrate year, but were specially extended to July 15, have broken down without any agreement being reached.

Between the synthetic producers of this country and Germany there was general agreement, with which the smaller synthetic producers were in accord on all important points. The breakdown was between the European synthetic producers and the Chilean nitrate industry, as represented by the Chilean Nitrate Co. (Cosach). It therefore seems probable that unless some form of agreement is, after all, negotiated in the near future, a cut in the price of nitrogenous fertilisers will be made.

During the course of Wednesday afternoon it was reported, however, that the conference had reassembled in a further attempt to arrive at some scheme which should cover the world nitrate business.

Price Reduction for Camphor Flowers

A reduction of 2d. per lb. in the price of English refined camphor flowers B.P. is announced by May and Baker, Ltd. For quantities of 1 cwt. upwards the price is now 2s. 8d. per lb.

A Pump which Operates by Air Pressure

Tungstone High Pressure Machine Die Casting Co.

In the Tungstone patent air-pressure pump, which is exhibited under working conditions by the Tungstone High Pressure Machine Die Casting Co., of Market Harborough (Stand No. B.23), compressed air is used as a kind of elastic piston to impart the necessary pumping force. Operating on this basic principle, however, air does not become mixed with the liquid as in the case of air lift systems or pumps in which the *mingling of compressed air with the liquid effects the raising* of the latter to the required level.

Compared with centrifugal pumps and plunger pumps, this Tungstone pump also embodies other unique features which have the ultimate object of eliminating periodical inspections and the inevitable stoppage which is so often due to lack of inspection and proper maintenance. For instance, there are no working parts in contact with the liquid which is being pumped, there are no parts which require lubrication, and the delivery pipe cannot be choked. Added to this, pumping may be continuous or intermittent, without the least tendency for spluttering or for the diffusion of the liquid. The absence of spluttering is very desirable where pumps are to handle liquids which have a tendency to " froth " or liquids which are greasy.

The body of this pump essentially comprises two cylinder-like reservoirs, one of which empties under pressure, whilst the other is filling by gravity. At the low air pressure of 15 to 20 lb. per square inch, liquid may be forced to any reasonable height at variable and controllable delivery speeds, as the pump is so designed that it automatically takes its low air pressure supply from a main of any higher pressure. The materials of construction employed are of a sufficiently wide range to meet requirements necessary in handling acids, alkalies, aqueous solutions of chemical salts, oils, and greasy liquids. Pumps at present in use are made in antimonial lead, chemical lead, cast iron, glass, acid-proof earthenware, ebonite, staybrite steel, and a special non-ferrous alloy.

Interlock Flooring for Plant Platforms

Babcock and Wilcox, Ltd.

Interlock flooring suitable for chemical plant is to be seen among the exhibits of Babcock and Wilcox, Ltd., of Farringdon Street, London, E.C.4 (Stand No. A.18). This flooring is an all-steel grated flooring with the " life " of steel, and consists of a series of parallel steel bars placed on edge, these being slotted to the neutral axis. The cross-section bars are pressed in, thus forming a rectangular pattern with all top edges flush. Each finished section is a light but inflexible panel embodying the well-known truss principles of engineering construction, by which a load applied at any point is distributed over a wide adjacent area, as no one member bears the load, which is shared by a number of adjacent members, and the full tensile strength of each member is applied in load resistance, because each member is supported at its top cord by the adjoining members. Maximum strength is thus secured with minimum weight of material. Each panel of interlock flooring is a solid unit : an air-cooled plate in which there is no looseness, rattling, warping, nor twisting. It cuts more easily than solid plate and is the only flooring manufactured with a complete surround which enables it to fit around pipes, columns, etc., without impairing the strength of the panel. For many years it has been recognised that for platforms surrounding plant, as well as for many other purposes, an open flooring freely admitting both light and air has many advantages.

Spiral-Gilled Tubes for Cooling Plant

Robert Jenkins and Co., Ltd.

At Stand No. B.14, which is occupied by Robert Jenkins and Co., Ltd., there is a special exhibit of spiral gilled steel tubes which are now made in tube diameters from 1 to 4 inches and in any convenient lengths up to 20 feet. The gilled tubes are very effective for cooling or heating plant, as they are light, unbreakable, and take up very little space per sq. ft. of heating surface. Among other exhibits in welded constructions are calorifiers with a capacity of 250,000 B.Th.U., or 200 gallons per hour, using steam at 25 lb. gauge pressure ; a container of 50 gallons capacity in Firth's Staybrite steel ; and a 50 gallon mild steel tank.

A Heat-Resisting Cast Iron Alloy

G.K.S. Combustion Co., Ltd.

Hercia, a nickel-chromium cast-iron alloy, having special and very distinct heat resisting properties comparing very favourably in practice with the much more costly " heat-resisting " steels, is shown by G.K.S. Combustion Co., Ltd. (Stand No. A 13). This material has a close-grained structure, the carbon being almost entirely in the combined state. It is strong and tough, and has a tensile strength of 17/20 tons per sq. in., at *normal temperatures. The compressive strength is about* 85/90 tons per sq. in., the melting point being in the region of 1650° C. The amount of expansion and contraction depends very largely upon the size and shape of the casting, but some indication of this may be obtained from the fact that a furnace firebar, 6 ft. long, 2 in. wide, 4 in. deep, subjected to an intense local heat for a period of three months, only showed a total longitudinal expansion of 0·125 in. The material will successfully withstand varying or consistent temperatures up to 950° C., and does not show signs of scaling at 1050° C. It can be cast in the same way as ordinary cast iron and is machineable. Another item of particular interest on this stand is the Foster quick-closing and self-sealing door for chemical vessels.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

ALLIANCE ARTIFICIAL SILK, LTD., Oulton Broad. M., 18/7/31.) Registered July 6, £9,000 debentures part of £113,000 ; charged on property at Oulton Broad, also general charge. *Nil. April 8, 1930.

FILTRATORS, LTD., London, W.C. (M., 18/7/31.) Registered July 1, £1,000 B debentures ; general charge (subject to prior debenture).

KENFORD, LTD., London, E.C., chemical manufacturers. (M., 18/7/31.) Registered June 30, charge, to Barclays Bank, Ltd., securing all moneys due or to become due to the Bank ; charged on Imperial Works, Balmoral Road, Watford. *£7,000. May 29, 1931.

PARENT COAL CARBONISATION TRUST, LTD., London, E.C. (M., 18/7/31.) Registered June 2, £49,000 debentures, part of £60,000 ; general charge. *Nil. September 2, 1930.

Satisfaction

YADIL PRODUCTS (1925), LTD., London, S.E., manufacturing chemists. (M.S., 18/7/31.) Satisfaction registered July 1, £20,000, registered October 9, 1929.

London Gazette, &c.

Company Winding Up Voluntarily

YADIL PRODUCTS (1925), LTD. (C.W.U.V., 18/7/31.) By special resolution June 30, 1931. Mr. G. W. Vinson, 9, King's Bench Walk, Temple, E.C.4, appointed liquidator.

New Company Registered

THE UNION DRUG CO., LTD., 70, Pall Mall, London, S.W.1.—Registered as a " public " company on July 8. Nominal capital, £25,000 in £1 shares. Chemists and druggists, manufacturers of and dealers in pharmaceutical, medicinal, chemical, surgical rubber, industrial and other preparations and articles, gases and by-products, chemical and mechanical engineers, drysalters, oil and colourmen, etc. Directors : H. Beecham, C. Dickinson, H. Green, A. H. Johnson.